

FJ FURY in action



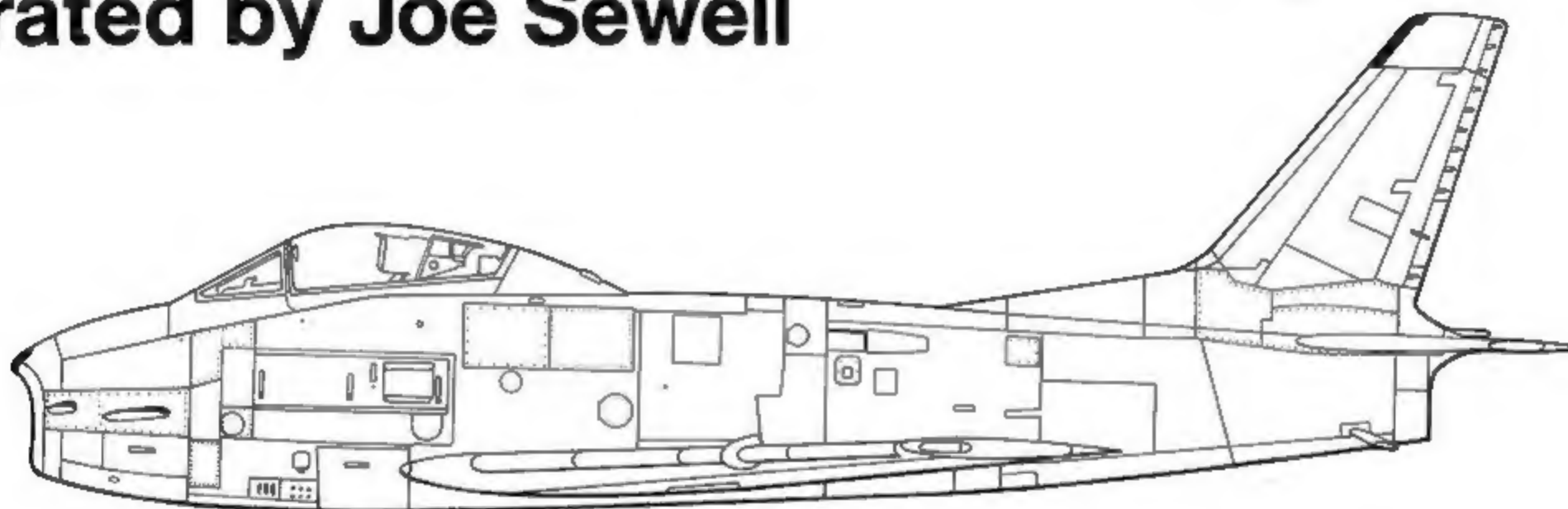
 Aircraft Number 103
squadron/signal publications

FJ FURY in action

By Jim Mesko

Color By Don Greer

Illustrated by Joe Sewell



Aircraft Number 103
squadron/signal publications



A pair of FJ-4 Furies of VA-214 deployed aboard the USS HORNET (CVA-12) fly over the Pacific near Hawaii during January of 1958. The aircraft in the foreground is assigned to the Commander of Air Task Group Four (CATG-4).



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Dedication

To the U.S. Navy and Marine pilots who risk their lives daily in the dangerous profession of carrier aviation. Their professionalism and dedication helps preserve world peace.

Author's Note

In September of 1962 the Department of Defense established a uniform method of designating American aircraft. Since the Fury came under this new system toward the end of its operational career, I have decided to use the original designations for the series throughout. Under the new system the FJ-3 became the F-1C, the FJ-4 became the F-1E and the FJ-4B became the AF-1E.

An FJ-3M Fury of VF-142 aboard the USS HORNET (CVA-12) patrols over the Pacific near Japan, during February of 1957. The Fury helped usher in the use of swept wing fighters in the fleet and was the first Navy fighter armed with air-to-air missiles. (USN)



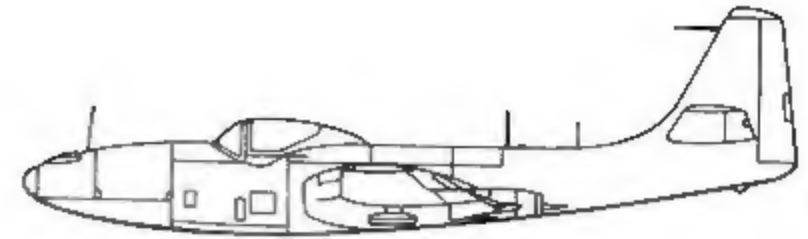
Introduction

The German introduction of jet fighters into combat during the later stages of the Second World War was viewed by the U.S. Navy and Marine Corps as a threat to their air superiority in the Pacific. The Navy felt that Japan, with German technical assistance, might introduce jet fighters into the combat zone. To counter this possible threat, the Navy issued a requirement for a carrier based jet fighter. As a result of this requirement, a request for proposals was formulated by the Bureau of Aeronautics (BuAir) and sent to a number of aircraft companies.

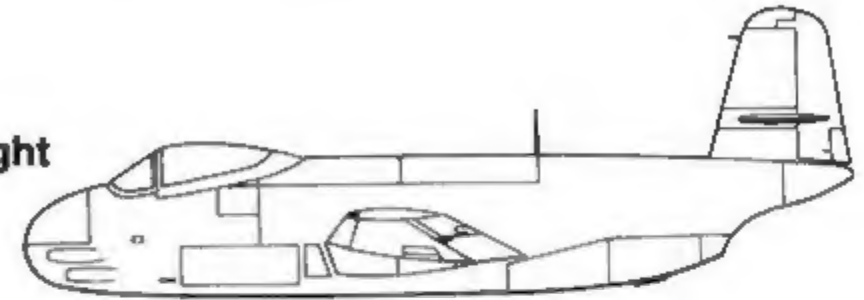
From the companies submitting proposals in response to the Navy's request, BuAir selected three for further development. Three different companies were selected, because the Navy felt that there was a need to provide for a backup against the possible failure of one or more of the designs. Jet technology was still in its very early stages and each new design broke new ground and had high risks. The Navy felt that it could not take a chance on a single design so three designs were selected for prototype construction.

One of the prototype XFJ-1s sits on a taxiway at Los Angeles International Airport during November of 1946. The XFJ-1 was built to meet a Navy requirement for a jet fighter to counter a possible Japanese threat. It was one of three designs selected for prototype construction. (USN)

**McDonnell
XFD-1
Phantom**



**Chance Vought
XF6U-1
Pirate**



These were the McDonnell XFD-1 Phantom, Chance Vought XF6U Pirate, and North American XFJ-1 Fury.

North American received an initial contract from the Navy for three prototypes on New Year's Day, 1945. Work on a mock-up began immediately and by March it had been completed. Using the mock-up, North American engineers began to refine their design (NA-134), making changes that would be incorporated into the prototype. In conjunction with the work being done for the Navy, North American had also begun development work on an almost identical land based version of the XFJ-1 for the Army Air Force, under the designation XP-86. Early in this program, the Army decided to adopt a swept wing configuration based on data obtained from captured German reports. This design change was also submitted by North American to the Navy, but was turned down for a number of technical reasons.

Actual construction on the three prototypes began during the Summer of 1945. The prototypes were to be powered by the 3,820 lbst General Electric J35 GE-2 turbojet engine. Engine development, however, was lagging behind and the engine was late in arriving at the North American plant. The first XFJ-1 prototype was completed in January 1946, but the engine was not ready for another six months. Finally, the engine was delivered and mated with the airframe during June.

The first prototype emerged as a simple, uncomplicated aircraft, since the Navy was unsure that the concept of jet carrier operations was going to prove workable. The axial flow G.E. engine allowed the Fury to have a simple straight-through airflow, unhindered by complex wing root or lateral type intakes such as those used on the Bell P-59 and Lockheed P-80. To gain access to the engine for maintenance, the upper portion of the fuselage from the rear of the cockpit back to the leading edge of the tail fin was removable.

In order to meet the requirement for low approach and landing speeds needed for carrier operations, the XFJ-1 was equipped with a low mounted, thin, straight wing with large trailing edge flaps. While this insured that the aircraft would have the required low landing speed, it also severely restricted the aircraft's maximum speed.

While the swept wing configuration adopted by the Army Air Force had proven that the basic design could have high performance and would have given the XFJ-1 tremendous growth potential, the Navy was still not convinced that jets could safely operate from aircraft carriers. Rather than take a chance that the gains that this configuration would give the Fury would mean that the aircraft could not safely operate aboard ship, the Navy proceeded with the straight wing configuration.

The XFJ-1 had a number of interesting features incorporated into its design. Retractable, slatted speed brakes were incorporated into the wing upper and lower surfaces. Early testing, however, proved that these could cause control problems if the brakes did not open together. This problem was highlighted in an incident where only one wing brake deployed, sending the aircraft out of control. As a result, the wing mounted brakes were replaced by rear fuselage mounted speed brakes.

With the wing housing the speed brakes, the prototypes could not incorporate a wing folding system. To help increase available space on the hanger deck, provision was made for a kneeling nose wheel. A small wheel was inserted into the main nose gear strut, then the nose wheel was retracted, allowing the aircraft to rest on the smaller wheel. With the nose down and the tail up it was felt that space lost because of the lack of folding wings could be made up by positioning aircraft with the nose tucked under the raised tail of the aircraft ahead of it. The system worked far better in theory than in actual operational use and, in the event, little use was made of this feature aboard ship.

Armament installed on the prototype consisted of six .50 caliber machine guns mounted on either side of the nose alongside the air intake. A total of 1,500 rounds of



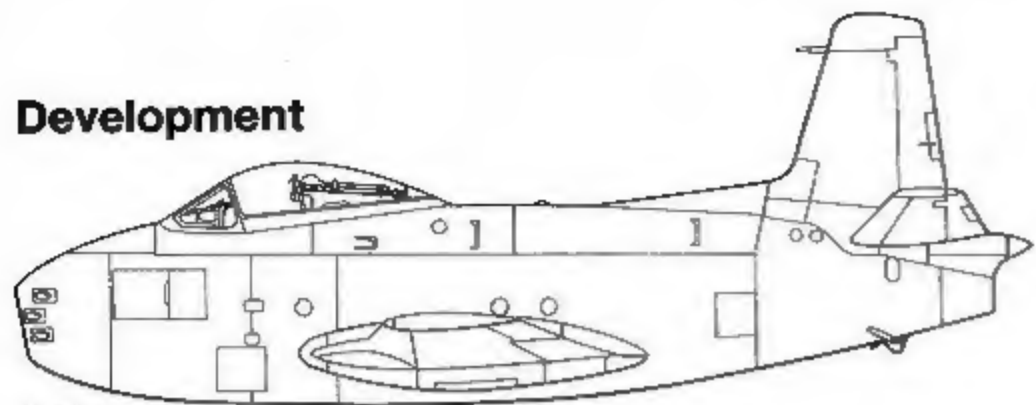
The Army Air Force counterpart to the XFJ-1 was the XP-86. Early in its development, the overall Pearl Gray XP-86 was redesigned with a swept wing configuration based on information obtained from captured German records. The swept wing greatly improved the aircraft's performance.

ammunition was carried for the guns and the pilot was provided with a Mk 23 gunsight. No provision was made for underwing ordnance.

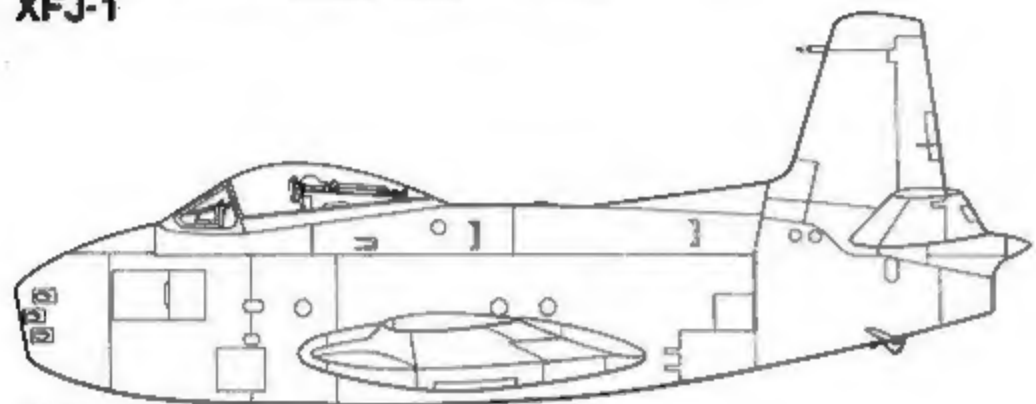
The first prototype began a series of taxi tests during late July that ran through early August of 1946 and made its maiden test flight during September. The second prototype followed a month later and the third prototype made its first flight during February of 1947. The flight tests revealed a top speed of 542 mph at 16,000 feet, a service ceiling of 47,700 feet and a rate of climb of 4,690 feet per minute. Pilot reports during these early flights indicated that the Fury handled well and little trouble with the aircraft or its systems was experienced. The normal amount of technical problems, common to any new aircraft, were discovered and the appropriate changes were made, but nothing of a serious nature (other than the wing mounted dive brakes) was discovered.

Company flight tests were completed by the end of the Summer and the three prototypes were turned over to the Naval Air Test Center for acceptance tests during September of 1947. The Navy had placed an initial production contract (signed on 28 May 1945) for 100 FJ-1s. This contract was later revised because of a number of reasons; the end of the war, Congressional budgetary restraints and a re-evaluation of the Fury's potential based on early flight testing. In the event, the revised contract called for production of thirty aircraft under the designation FJ-1. These aircraft would all be built at North American's Los Angeles facility.

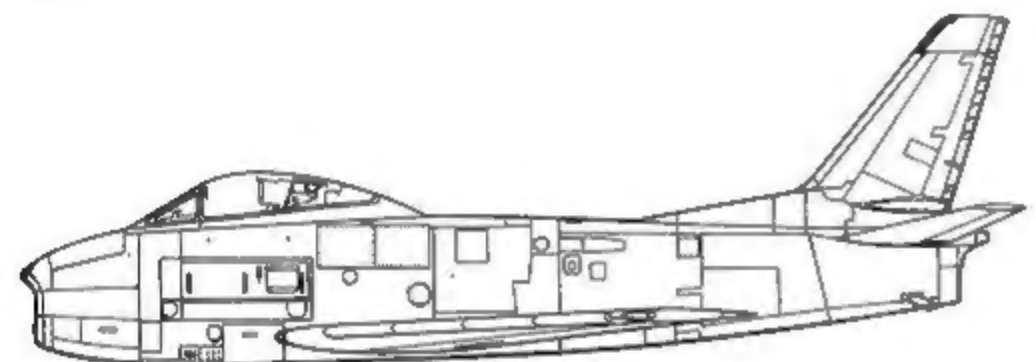
Development



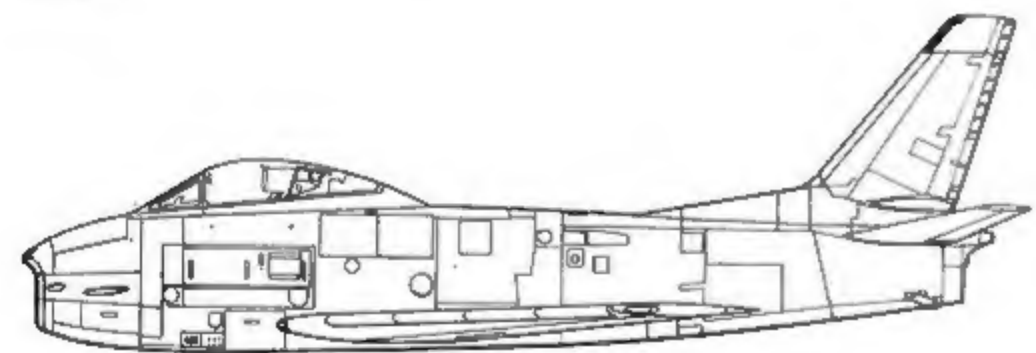
XFJ-1



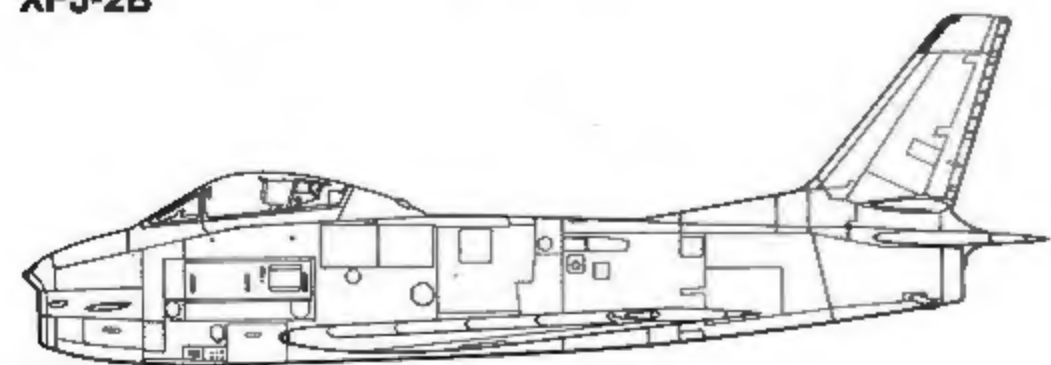
FJ-1



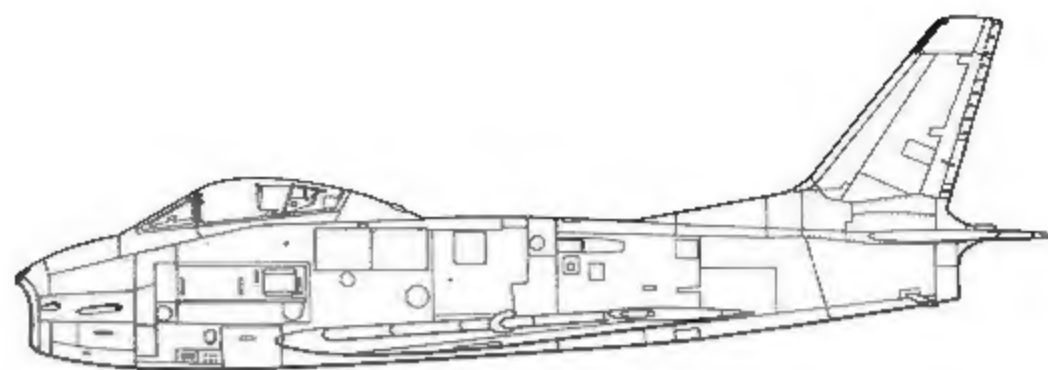
XFJ-2



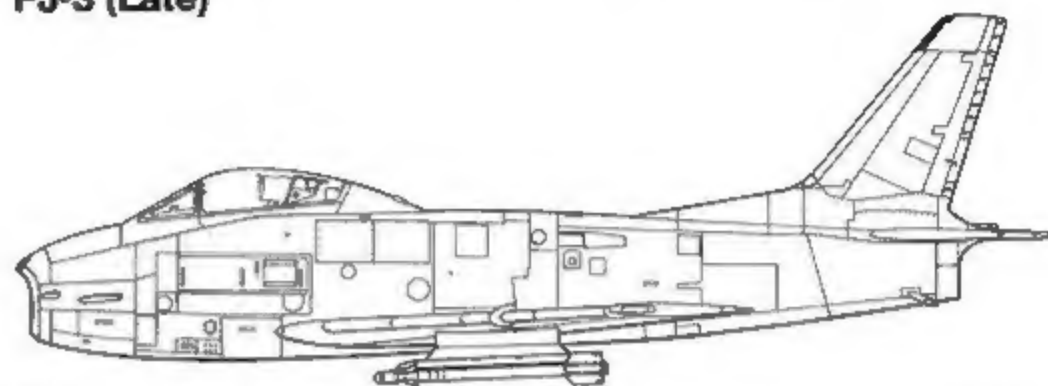
XFJ-2B



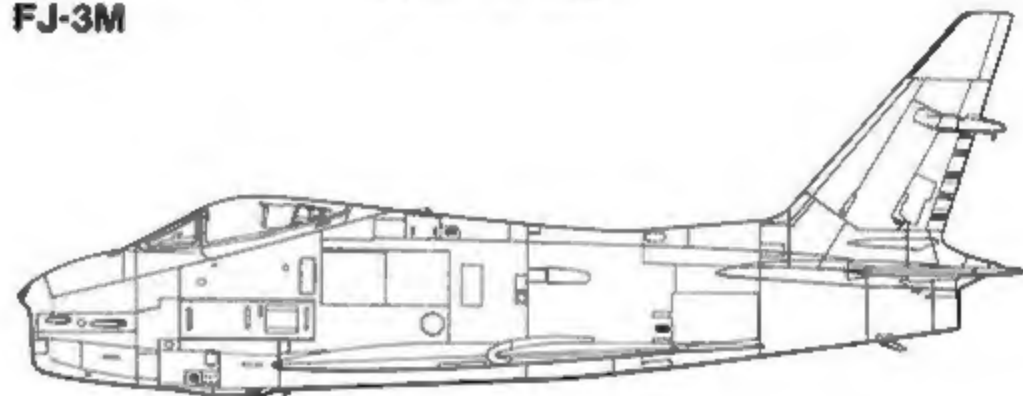
FJ-2



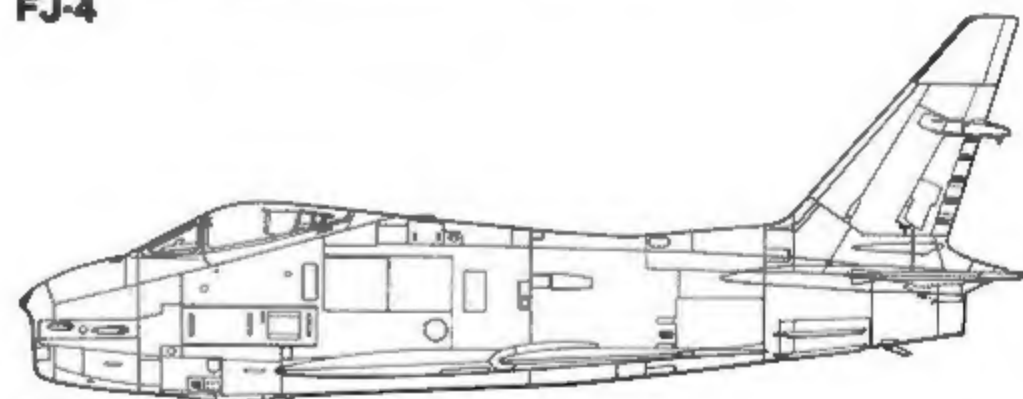
FJ-3 (Late)



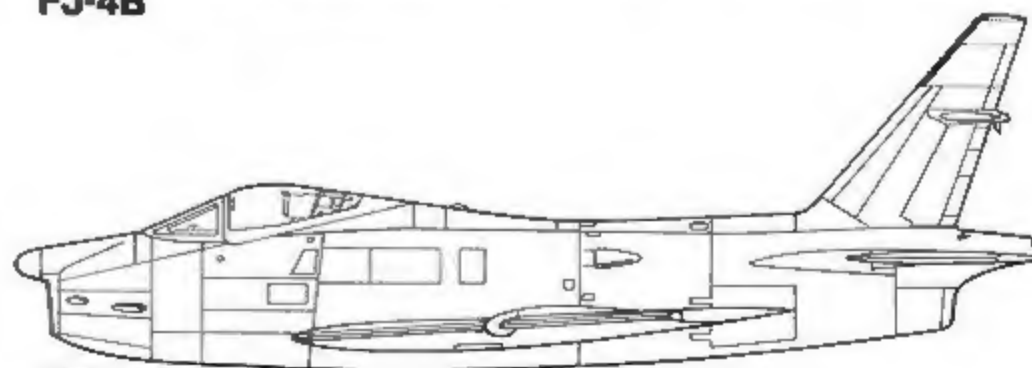
FJ-3M



FJ-4



FJ-4B



XFJ-4F

FJ-1 Fury

Shortly after accepting the prototype XFJ-1s, the Navy began to receive the first production FJ-1s off the North American production line. The first production Fury was delivered on 5 October 1947 to the Naval Air Test Center (NATC) located at Naval Air Station (NAS), Patuxent River, Maryland. The production FJ-1 Fury differed from the prototypes in having the wing mounted speed brakes replaced by fuselage mounted speed brakes and with the addition of wing fillets to improve the airflow over the wing/fuselage joint.

Between October of 1947 and January of 1948, NATC received a total of seven production FJ-1s (in addition to the three XFJ-1 prototypes). These aircraft were subjected to an extensive battery of tests to determine how they would function under operational conditions and to devise techniques for operational and tactical use. The test pilots at Pax River, as NATC is known among Navy pilots, put the jets through their paces and by June of 1948 two of the Furies had been destroyed in accidents. The remaining eight aircraft were eventually handed over to either VF-5A (one), the Naval Air Reserves (four), or were retired from the inventory and scrapped (three).

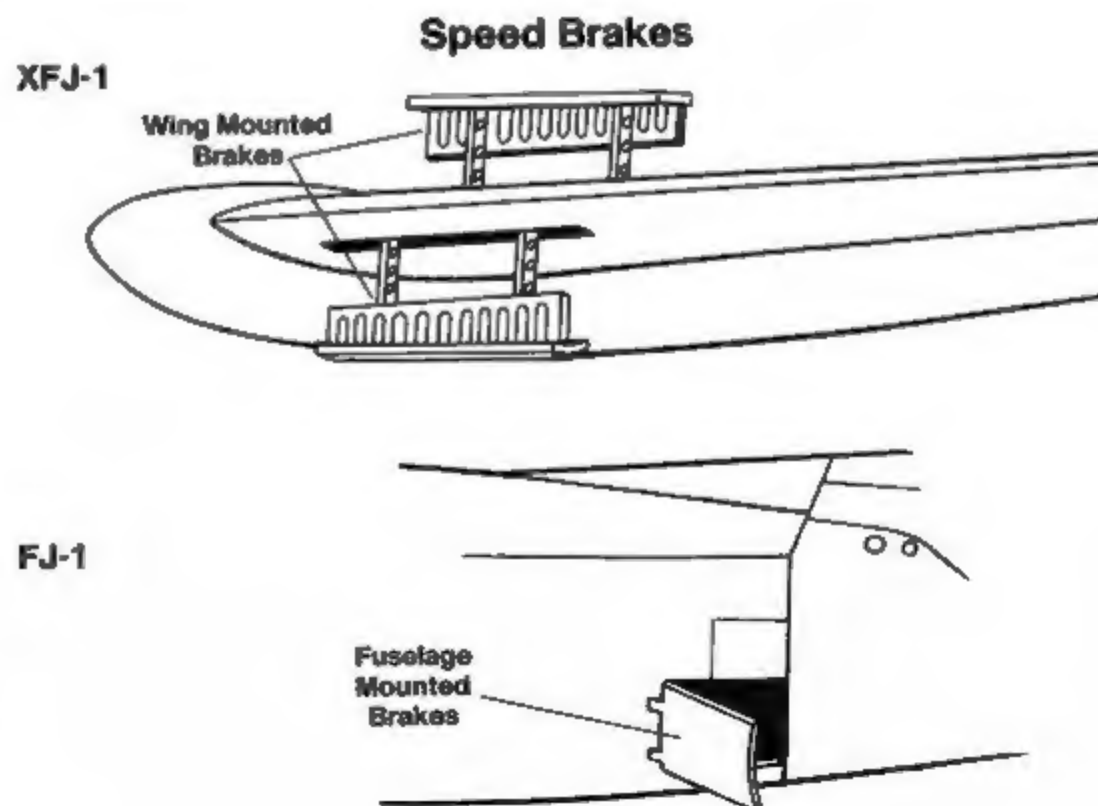
During the initial flight acceptance tests, a tragic accident was narrowly avoided by a combination of luck and pilot skill. While engaged in a spin test, the canopy came loose and hit the pilot, Al Conover, in the head, knocking him unconscious. He came to in time to pull the aircraft out of an 8 G dive at 1,400 feet, but while climbing for altitude, he blacked out again. Coming to, he found that the Fury was doing slow rolls at 16,000 feet. Dizzy and bleeding, Conover managed to bring the Fury in for a safe landing at Patuxent River. In another test conducted at Muroc Dry Lake (now Edwards Air Force Base) California, one Fury lost elevator control during a high speed dive. The pilot was, however, able to safely land the aircraft by using the elevator trim tabs. Such incidents served to underline the generally good flying characteristics and stability of the FJ-1.

During November of 1947, deliveries began to the only operational squadron to fly the Fury, VF-5A. Based at NAS North Island, San Diego, California, VF-5A (redesignated VF-51 during August of 1948) was assigned the task of testing the Fury (and jet aircraft in general) under operational conditions — at sea. One problem that surfaced was the short time between overhauls (TBO) for the G.E. engines. In squadron service it was common practice to pull the engines for overhaul after only thirty-five hours of operation. While this was far better than the ten hour TBO allowed during the early flight tests, it was far short of what was considered acceptable for a first line fighter by the Navy. To increase flying time, the aircraft were towed whenever possible, rather than using the engines for taxiing. The short Time Between Overhauls was a problem throughout the FJ-1's career.

Shortly after taking delivery of their first Furies, the squadron (under CDR Evan "Pete" Aurand) commenced a series of operations designed to show the potential of the Fury. During February of 1948, the unit broke three West Coast speed records. The following month, Aurand and another pilot made the first FJ-1 carrier landings when they touched down on the deck of USS BOXER (CV-21). These landings were the first jet carrier landings conducted by a front line squadron, and the information gained from these and subsequent operations helped formulate procedures for future jet carrier operations. During one evaluation Aurand attempted a deck run takeoff from USS BOXER (without the aid of the ship's catapult). He narrowly missed going into the sea because of the slow acceleration of the Fury's jet engine. This test revealed that the safest way for the FJ-1 to take off from a carrier was by use of the catapult and this became the standard operational procedure during Fury deployments aboard ship. Additional tests also showed the Fury's potential against piston engined aircraft, such as the P-51 Mus-



This FJ-1 Fury was used by NATC for carrier suitability tests. The white lines were photographic reference marks used during filming of takeoffs and landings. Production FJ-1s differed from the prototypes in having the speed brakes repositioned from the wings to the fuselage. (USN)



tang and F8F Bearcat, two outstanding fighters that were in operation at that time. While the Fury was slower in getting off the runway, once airborne, it quickly overtook both fighters in the climb and left them far behind.

While such tests and operations showed the potential of the Fury (and naval jet fighters), numerous problems arose during its career with VF-5A (VF-51). Normal operations took their toll of the aircraft and the maintenance crews constantly worked to keep the FJ-1s in the air. Spare parts were in short supply, since nearly everything had to be obtained directly through North American. Problems arose with the landing gear, particularly the nose gear, which was found to need reinforcement to handle the stress of carrier landings. The aircraft's range, even with wing tip fuel tanks installed, was relatively short. On a number of occasions aircraft barely made it back to North Island. A number were forced to crash land when CDR Aurand tried to stretch their fuel to the limit during operations in support of the fleet.

When the squadron deployed aboard the USS PRINCETON (CV-37), landing accidents took a heavy toll of the aircraft. The cause of the accidents was traced to a structural failure of the landing gear/wing joint. The landing gear failures and problems gave the Navy a great deal of knowledge related to jet carrier operations which helped in the development of future aircraft, handling techniques, landing and takeoff procedures, and even carrier design and construction.

During September of 1948, seven FJ-1s of VF-51 (ex-VF-5A) took part in the Bendix cross-country jet race. Taking off from Long Beach, California, the aircraft headed for

Cleveland, Ohio. Stopping once for fuel, five of the FJ-1s made it to Cleveland in just over four hours. Of the two which did not finish, one was unable to take off from Long Beach because of mechanical problems, while the other was forced to make an emergency landing in Ohio. While no new speed records were set, each aircraft had demonstrated the capability of the Navy's new fighter by flying the course with a full load of ammunition. None of the aircraft were modified in any way for the race.

Following the Bendix race, the squadron began to turn over their Furies to the Overhaul and Repair Center at Alameda, California, as they began to transition to the Grumman F9F Panther. By the Summer of 1949, the process was completed and the last of VF-51's FJ-1s had been turned in. After refurbishing, the aircraft were assigned to four Naval Air Reserve (NAR) stations to serve as jet transition trainers. The stations were NAR Oakland, California; NAR Los Alamitos, California; NAR Olathe, Kansas and NAR Dallas, Texas. These stations used the Furies from 1950 until 1953, when the remaining aircraft were turned over to either the Naval Air Technical Training Center (NATTC), NAS Jacksonville, Florida, or the Maintenance and Service Pool at NAS Willow Grove, Philadelphia. By early 1954, all FJ-1s had been retired from the Navy. They ended up as either hulks used for fire fighting training or as ground instructional airframes for mechanics. One was sold to a civilian, who later reportedly tried to sell it to Cuba. This aircraft and one other FJ-1 were eventually preserved. One is located at a museum in Connecticut and the other is at the Naval Aviation Museum, Pensacola, Florida.

Access to the engine of the FJ-1 was made by removing the top of the fuselage behind the cockpit. In order to save fuel and extend the short time between overhauls, FJ-1s were normally towed rather than taxied. (USN)





The Naval Air Test Center (NATC) found that the handling characteristics of the Fury were good and that the aircraft exhibited no serious problems. This Fury was the second FJ-1 off the production line. The intake warning markings on the nose are in Red. (USN)



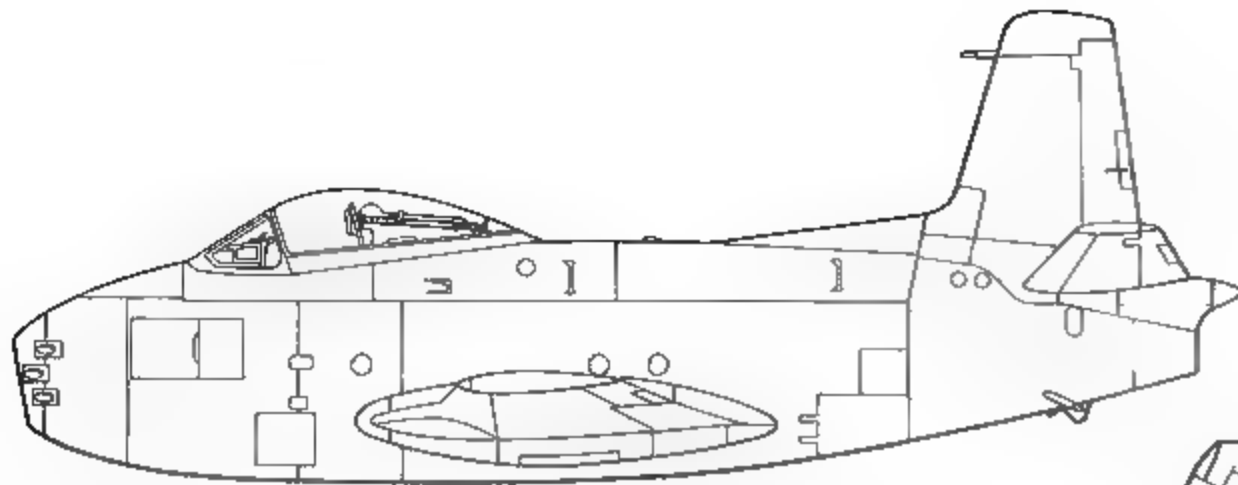
This FJ-1 Fury, the sixth production aircraft, was used by NATC for electronic and tactical testing. After completing its service life at Pax River, the aircraft was turned over to the Naval Air Reserve unit at Oakland, California. (Larkin)

A flight of FJ-1s of VF-5A (later VF-51) pass over NAS North Island, San Diego, California, in the landing configuration. VF-5A was the only fleet unit equipped with the Fury and laid much of the foundation for future jet operations aboard aircraft carriers. (USN)



To save space aboard ship, the FJ-1 was fitted with a small wheel mounted on the nose wheel strut which allowed the gear to be retracted, raising the aircraft's tail up. This allowed aircraft to be parked more closely together. The system worked, but was rarely used. (USN)





Specifications

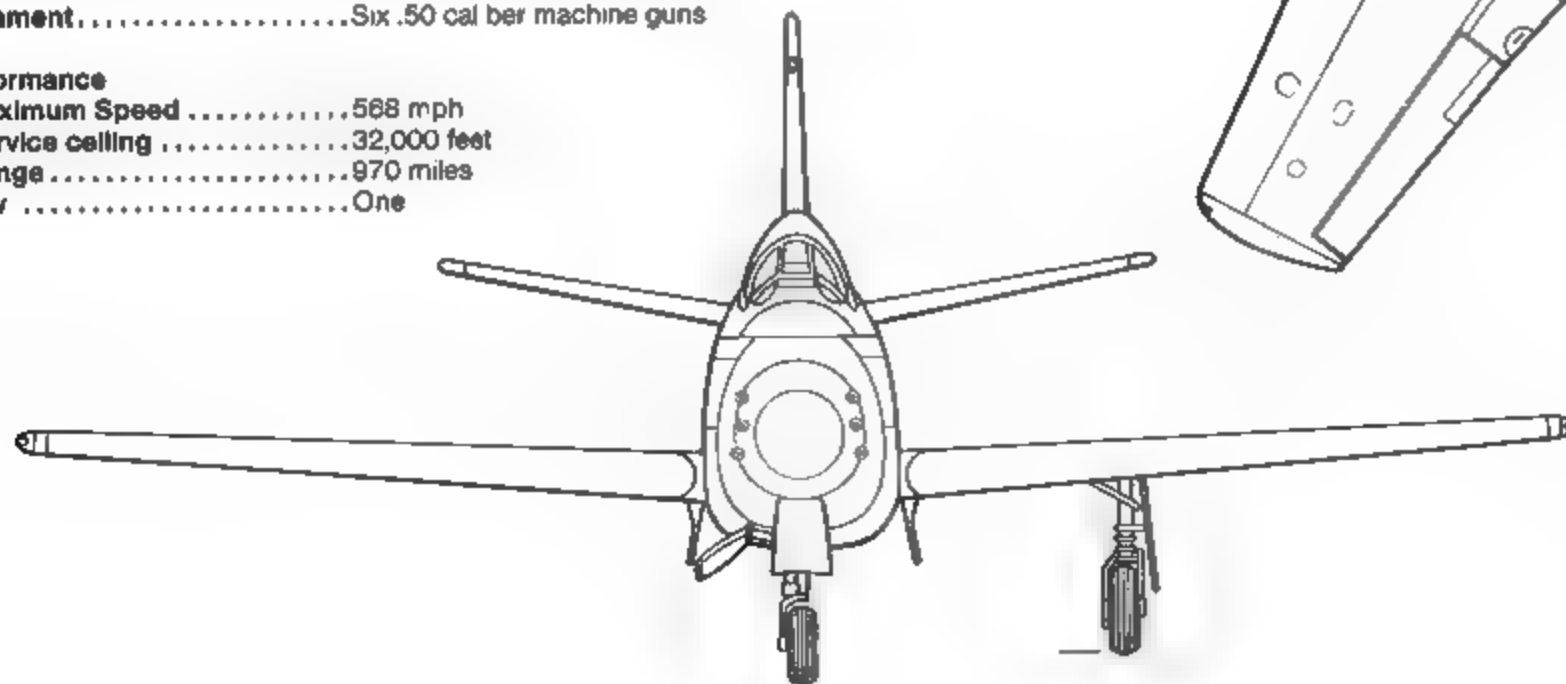
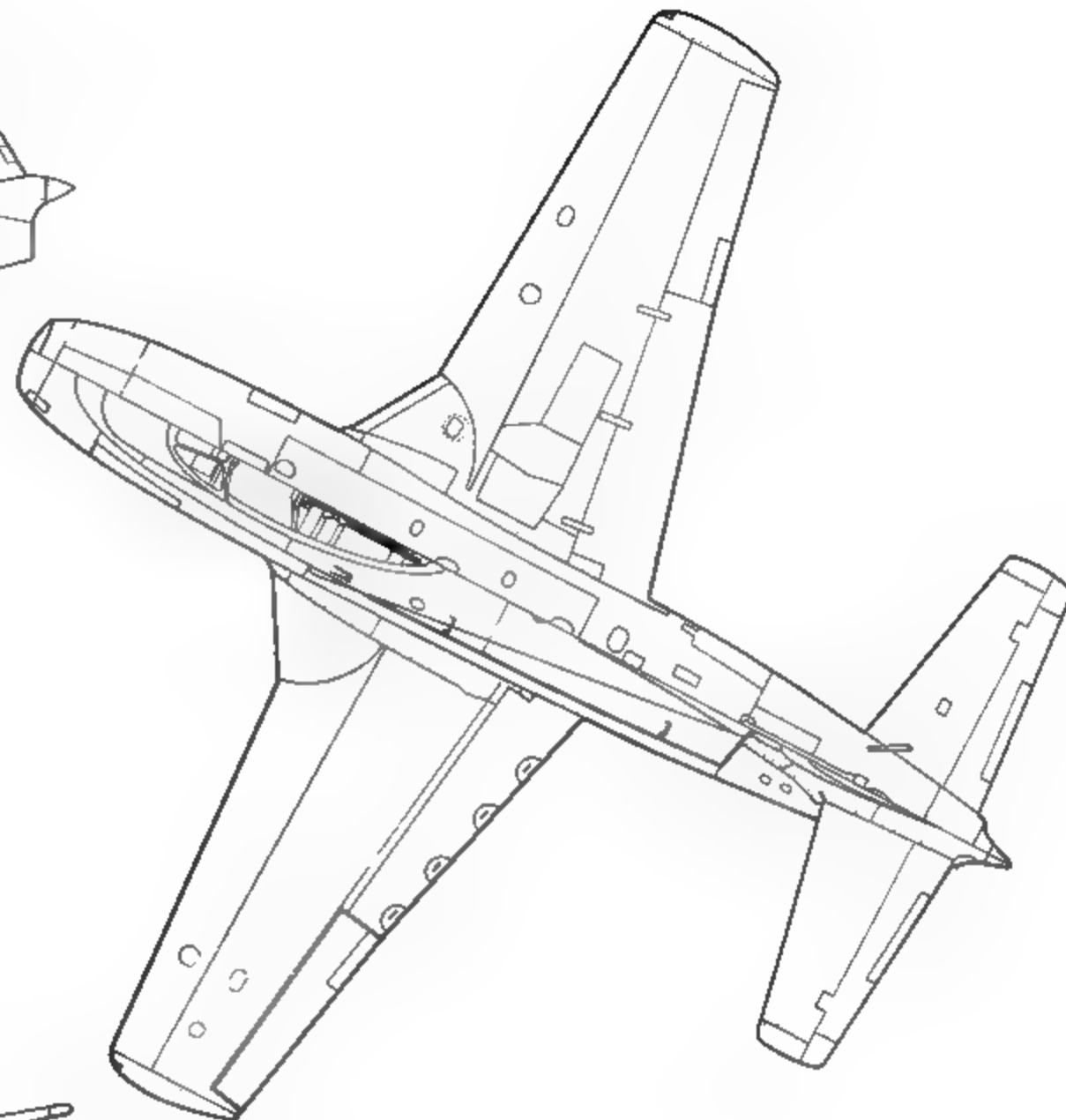
North American FJ-1 Fury

Wingspan 38 feet 2 inches
 Length 34 feet 5 inches
 Height 14 feet 10 inches
 Empty Weight 8,843 pounds
 Maximum Weight 15,800 pounds
 Powerplants..... One 3,820 bsh General Electric
 J-35-GE-2 turbojet engine

Armament..... Six .50 cal ber machine guns

Performance

Maximum Speed 568 mph
 Service ceiling 32,000 feet
 Range 970 miles
 Crew One





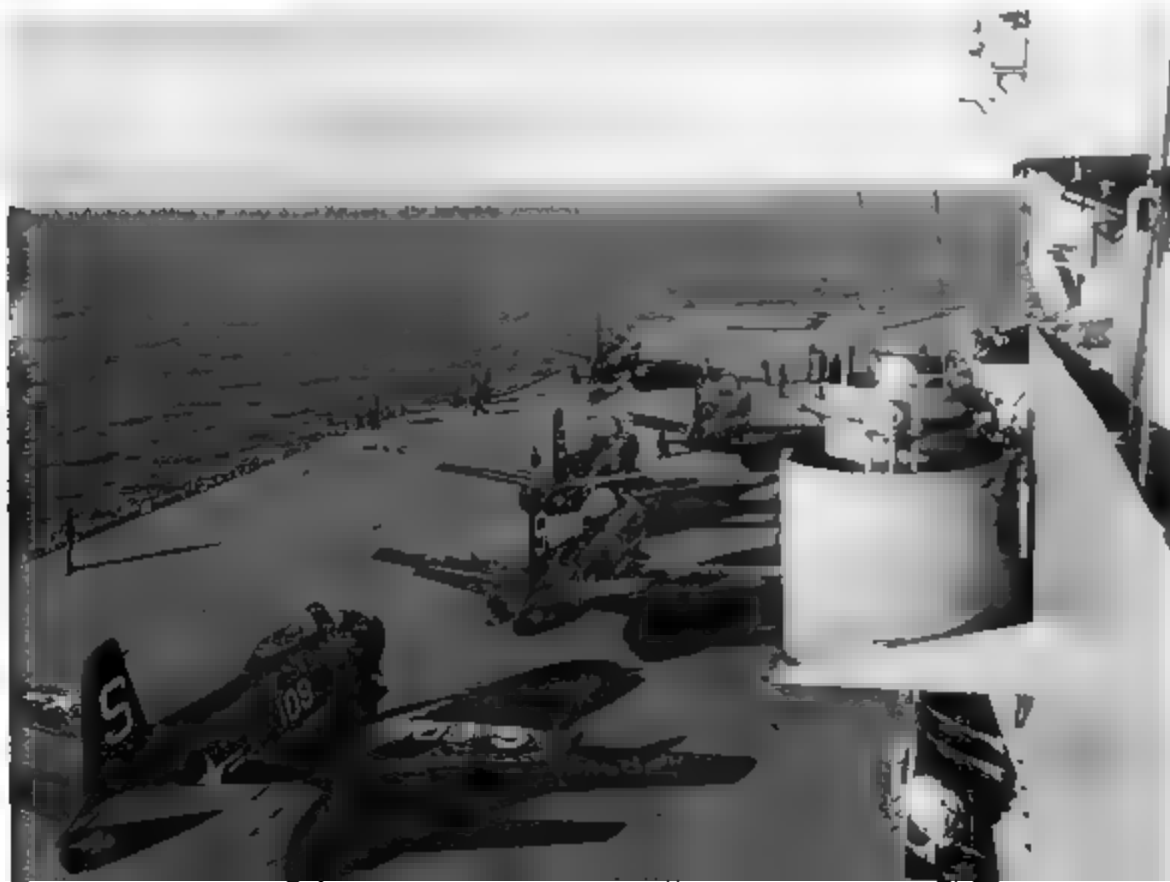
FJ-1s required a relatively long takeoff run. Although much slower in takeoff than either the P-51 or F8F (the two best piston engine fighters at the time), once airborne, the Fury would outclimb and outrun both of them. Major drawbacks of the early jet fighters were their short engine life and limited range. (USN)



These VF-51 pilots took part in the 1948 Bendix Trophy Race. CDR Evan "Pete" Aurand, the squadron commander (center) would later be the project officer on the FJ-2 Fury program and retire as a Rear Admiral. (USN)

FJ-1s of VF-5A prepare for launch from USS BOXER during carrier qualifications off the coast of California. VF-5A carried out the first operational jet carrier landings during March of 1948, when two Furies made a series of launches and arrested landings aboard USS BOXER. (USN)

A pair of FJ-1s on the bow catapults of USS BOXER are prepared for launch. Although the Fury could take off from a carrier with a deck run, this method was dangerous because of the aircraft's slow acceleration. During normal operations, the Fury was catapult launched. (USN)





An F4U Corsair, F8F Helicat and an FJ-1 Fury fly formation over NAS Oakland, California, during the Fall of 1949 to advertise the introduction of the FJ Fury into the Naval Air Reserve. Eventually, four Weekend Warrior reserve units would operate the Fury. (USN)



FJ-1s assigned to NAS Oakland were prominently marked with a large Weekend Warriors logo on the nose in White. Additionally, a large Orange stripe was painted around the rear part of the fuselage identifying the aircraft as being assigned to the reserves. (Larkin)

A formation of Furies from NAS Oakland fly over the Oakland Municipal Airport just after the start of the Korean War. The FJ-1 was used as a transition trainer for reserve pilots to give them jet experience before going on to either the F9F Panther or F2H Banshee. (USN)



XFJ-2

While the FJ-1's performance was disappointing, the Navy remained reluctant to adopt the swept wing design, as the Air Force had done with the F-86. The F-86A had entered service and proved to be an excellent performer. Although Navy planners realized that a swept wing would improve performance dramatically, the strict requirement for low approach and landing speeds could not be met by existing swept wing designs. As a result, all early operational Navy jet fighters (F9F Panther, F2H Banshee, and F3D Skyknight) retained straight wings.

During June of 1950, North Korea invaded South Korea and the United States became involved in a shooting war in Korea. Navy and Marine Corps aircraft teamed up with the Air Force to quickly gain air superiority over the North Korean Air Force. After that, they provided air support for the ground troops as the war seemed to be approaching a successful conclusion toward the end of 1950. This suddenly changed, however, when China entered the war during late 1950. The Chinese threw United Nations forces back across the 38th Parallel and introduced a new aircraft into the fighting: the swept wing Soviet built MiG-15. The MiG quickly proved superior to all UN aircraft in Korea, except the F-86A Sabre which the Air Force rushed to Korea.

Realizing that a swept wing fighter was needed, the Navy began to look for a way to make up for lost time. North American had initiated a project (NA-181) for a navalized F-86 on 30 January 1951 and had issued a formal proposal to the Navy one week later. On 10 February, the Navy officially accepted the proposal and appointed CDR Aurant as the project officer (he had been an early advocate of the swept wing design).

Because of the pressures of the war, the Navy realized that Congress would readily provide funds for adaptations of existing designs, but was less willing to put forth funding for new projects. As a result, the navalized F-86 project was given the designation XFJ-2, when in fact, it should have been given the designation XF2J. At one time there was considerable support for the name Sea Sabre, but, again to avoid any Congressional funding problems, the Navy decided to retain the name Fury for the new fighter. A formal contract was approved on 29 May 1951 and in late June the mock-up was inspected at the Los Angeles plant.

The Navy ordered three pre-production aircraft, two of which were ordered on 8 March and were basically navalized F-86E-10 Sabres. These aircraft were modified with catapult points, V-frame arresting hooks, and a lengthened nose wheel strut to give the aircraft a higher angle of attack during takeoff and landing. Both aircraft were powered by a 6,000 lbst J47-GE-13 engine.

The third (NA-181) was designated the XFJ-2B, with the B indicating special armament. This aircraft had the standard six .50 caliber machine guns, found on the F-86E, replaced by four 20mm Colt Mk 12 cannons with 600 rounds per gun. This aircraft did not have the full modification package planned for the XFJ-2 and was ready for testing before the other two test aircraft. On 27 December, North American test pilot, Bob Hoover, made the first test flight of the XFJ-2B. After its initial company testing, the XFJ-2B was sent to the Navy ordnance facility at China Lake for extensive armament tests.

Upon completion of these tests, the Navy decided to arm production FJ-2s with the cannons. While these tests were going on, work continued on the other two aircraft and on 14 February 1952 the first of these was flown (without armament). After testing the various modifications, North American delivered both pre-production aircraft to NATC at Patuxent River. Following their acceptance tests, the two XFJ-2s underwent carrier qualifications aboard USS MIDWAY (CVB-41) and USS CORAL SEA (CVB-43), the

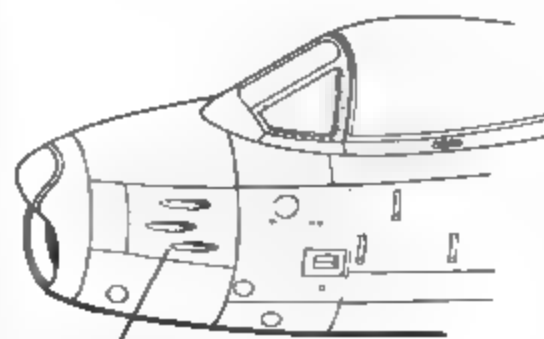


Although it was the third XFJ-2 prototype ordered, the XFJ-2B (BuNo 133756) was the first to fly. The aircraft was basically an F-86E Sabre modified with four 20mm cannons instead of six .50 caliber machine guns. The first two prototypes were more extensively modified and took longer to prepare for flight testing. (USN)

largest carriers in service at the time. Unfortunately, these tests proved less than satisfactory and a number of modifications were deemed necessary to make the XFJ-2s carrier suitable. The problems included a weak nose gear and arresting hook bumper. Additionally the suitability board rated the FJ-2's low speed handling performance during approach and landing as marginal. As a result, it was decided to issue the majority of the production FJ-2s to the Marine Corps for land based operations until these problems could be solved.

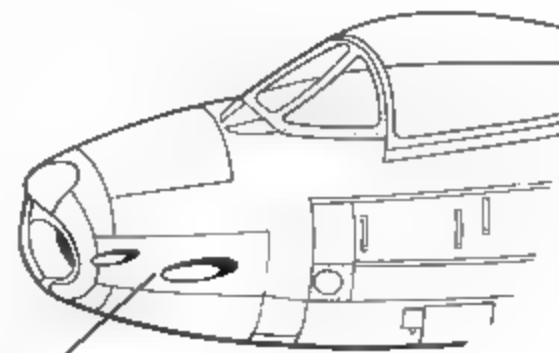
Armament

F-86E



Six .50 Caliber Machine Guns

XFJ-2B



Four 20mm Cannons



(Above) The first XFJ-2 prototype (BuNo 133754) leaves the deck of USS CORAL SEA during the Fury's carrier qualifications. The catapult bridle (cable) is visible as it falls away, just below the aircraft's tail. (USN)

(Below) Deck crewmen push the second XFJ-2 prototype (BuNo 133755) into position for launch aboard USS CORAL SEA. The pilot has the canopy open and his seat in the full up position. (USN)



FJ-2 Fury

Construction of production FJ-2s was undertaken at North American's newly acquired plant in Columbus, Ohio, (formerly a government plant run by Curtiss Wright). Production FJ-2s differed from the prototypes in a number of ways. The powerplant was changed from the the General Electric J47-GE-13 to the 6,000 lbf J47-GE-2 (Navy version of the J47-GE-27). The cockpit was redesigned to meet naval requirements and the canopy was reshaped, being sloped downward at the front to improve the pilot's forward view during approach and landing. The wings had a hydraulic wing fold system which was controlled electrically by the pilot, although a manual over-ride was included so that ground crews could also spread or fold the wing. While the all flying horizontal stabilizers on the prototypes had the same dihedral as the F-86, production FJ-2s had horizontal stabilizers that lacked dihedral.

The armament was the same as on the XFJ-2B: four Colt Mark 12 20MM cannons with 600 rounds per gun. The pilot was provided with a Mark 16 mod 2 gun sight which was used in conjunction with an AN/APG 30 ranging radar set. The radar antenna was mounted in the nose at the top of the air intake.

The main landing gear track was increased by eight inches over the XFJ-2. The V-shaped arresting hook, catapult attachment points, and lengthened nose wheel strut of the XFJ-2 were retained. Even with these changes, the FJ-2 remained quite similar in appearance to the Air Force F-86F slatted wing Sabre.

Unfortunately, the additional weight of the specialized naval equipment had an adverse effect on the FJ-2's performance when compared to the F-86F. The FJ-2 was almost a thousand pounds heavier than the Sabre with no increase in engine power and, as a result, the FJ-2 was somewhat slower, had 150 miles less combat range, and could not climb as high as the F-86F.

The first production FJ-2 rolled off the assembly line during November of 1952, however, the critical need for F-86s in Korea caused Air Force production to receive priority over the Fury. Only seven FJ-2s had been produced by the time the Korean War ended during the Summer of 1953. With the end of the war, Fury production increased marginally, with a further eighteen being produced by the end of the year. From early 1954, the tempo of production greatly increased. Initially the Navy had contracted for 300 FJ-2s, but with the Fury's carrier suitability problems and the end of the Korean War, this figure was reduced to 200 aircraft. The last of these were delivered during September of 1954, a remarkable output compared to the earlier production rates.

The first few FJ-2s off the production line were delivered to the Navy, but following the decision to equip Marine squadrons with the aircraft, the bulk of the production run went to six Marine fighter squadrons, three in the Atlantic and three in the Pacific. The first squadron to equip with the FJ-2 was VMF-122, based at Marine Corps Air Station (MCAS) Cherry Point, North Carolina, during January of 1954. The unit quickly amassed a large number of flight hours in the FJ-2 through an intense flying training program. The squadron commander set a goal of 1,000 flight hours a month and each pilot flew at least one sortie each day, weather permitting. The squadron quickly became highly proficient with their new aircraft in a relatively short period of time. During March of 1955, VMF-122 deployed to the Mediterranean as part of Carrier Air Group (CVG) 17 embarked aboard USS CORAL SEA, returning in September.

In the Pacific, VMF-235 took delivery of their first FJ-2s during the Spring of 1954 and participated in trials aboard USS HANCOCK (CVA-19), which had recently been equipped with C-11 steam catapults (the first carrier to be fitted with these catapults). During the trials, numerous aircraft types were tested and the FJ-2s experienced pro-



Production FJ-2s had no dihedral to the horizontal tail surfaces and a modified canopy. Despite these and other modifications, the aircraft still had poor carrier landing characteristics. After testing aboard USS HANCOCK (CVA-19), the FJ-2 was cleared for restricted carrier duty. (USN)

blems with the nose gear forks and arresting hook bumper support, with a number of failures of both being reported.

As a result, the fourth production FJ-2, along with four aircraft from VMF-235, were modified with strengthened nose wheel struts and arresting hook bumpers, although even with the changes, the Fury was still deemed unsuitable for carrier operations. The Navy decided to equip carrier squadrons with the Grumman F9F-6 Cougar which, although slower than the Fury, had better carrier performance.

While these operational tests were underway, an effort was made to modify the Fury with the extended leading edge wing used on late model F-86 Sabres. During August of 1953, the third production FJ-2 was fitted with a full cord wing fence. Unfortunately, this modification caused the aircraft to suddenly roll and yaw, followed by a stall. The stall occurred without any advance warning, which could easily prove fatal to a pilot on a carrier approach. As a result, the wing modification was dropped.

The following year a thick cambered wing fence was tried in conjunction with a second wing fence positioned close to the wing tip. While this provided enough stall warning in a power on approach, problems were encountered during landing configuration. The aircraft did not give an adequate stall warning and a severe yaw problem occurred during a reduced power glide. In October of 1954, another configuration was tried. Two short cord wing fences, which covered only the wing leading edge, were fitted to the third FJ-2. This configuration seemed to solve both the stall warning problem and improved handling characteristics in all situations. As a result, wing fences were later fitted on the majority of FJ-3s.

The FJ-2 also faced two problems which seriously impaired its combat potential, especially in air-to-air gunnery. Early in the armament tests conducted with the XFJ-2B, it was found that empty shell casings, ejected from ports under the fuselage, tended to strike the aircraft along the fuselage, wing tips, and elevators. North American engineers decided to install a storage bin in the fuselage, below and behind the guns, to solve the problem. Tests were conducted by the Navy to make sure that the shell casings did not accumulate too fast, causing the guns to jam, and that gun gases did not build up to explosive levels within the bin. Eventually, the storage bin was cleared for operational use and completely solved the problem.



The few FJ-2 Furies that were used by the Navy were used primarily for experimental work and test flying. The fourth production Fury was modified, based on information from the prototype tests, and underwent deck trials aboard USS CORAL SEA during the Fall of 1953. (USN).

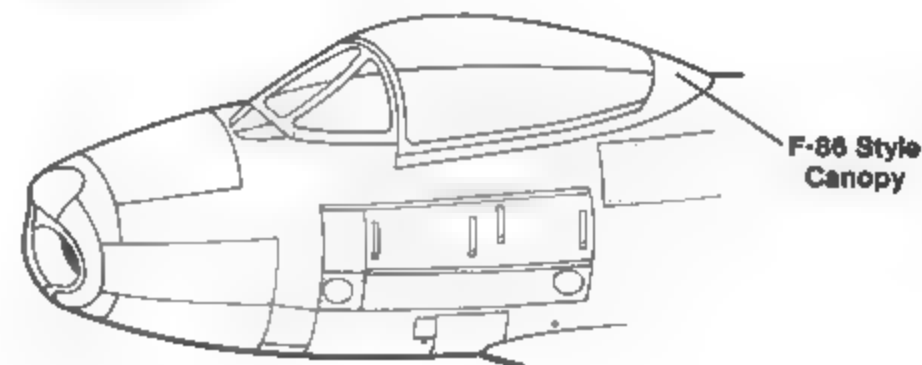
Following their intense workup, VMF-122 deployed aboard USS CORAL SEA for a Mediterranean cruise as part of Carrier Air Group 17 during March of 1955. Two of the squadron's FJ-2s move up to the catapults as a third clears the starboard bow. (USN)



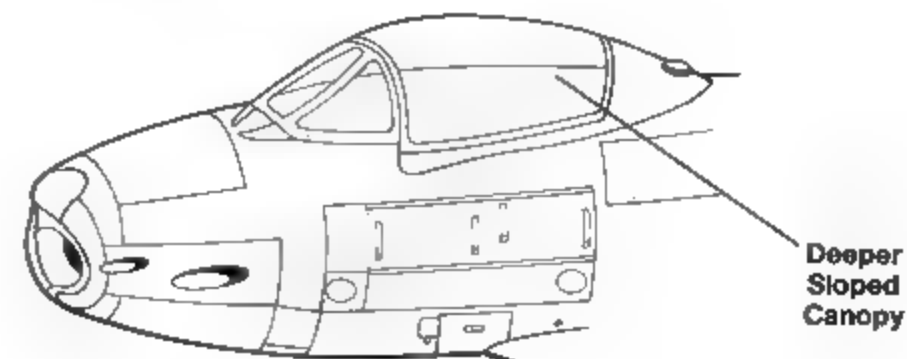
An overall natural metal FJ-2 taxis out for its delivery flight to a Marine fighter squadron. The majority of FJ-2s used by the Marines were delivered in natural metal with Black numbers and codes. (USN)

Canopy

XFJ-2



FJ-2



The second problem was not as easy to fix. Prior to the FJ-2 series, the gun aiming line was right down the roll axis of the aircraft. As the aircraft pulled Gs, pilots were able to compensate while lining up on their target. With the FJ-2, however, the aim point was computed for an average set of conditions and the guns were angled downward to converge at a given spot under these average conditions. Unfortunately, other flight conditions, which were not factored into this "average" solution, resulted in serious problems with target acquisition and tracking.

Extensive firing tests eventually showed that this "average" aiming system solved none of the common gun aiming problems and actually created a number of additional problems. Production had already started on the FJ-3 program before the test results were available and it too inherited the same gun system. As a result, early Furies were severely handicapped in air-to-air combat capability. It became common practice for fighter pilots flying the FJ-2 to get in far closer to the target before firing than was necessary with any other Navy fighter.

Service life of the FJ-2 was rather short. When newer models of the Fury became available during 1954, plans were made to replace the Marine FJ-2s with these or other aircraft types. The replacement program began during 1955 and by 1957, all Marine squadrons had turned in their FJ-2s for later model Furies or newer aircraft, such as the F-8 Crusader. The FJ-2s were assigned to either Naval and Marine Reserve units or to various support facilities and squadrons. By the end of the 1950s, the FJ-2s had been completely phased out of service. Some had been placed in storage at Davis Monthan Air Force Base while others were in use as training aids at various maintenance schools.



This section of FJ-2s of VMF-122 over MCAS Cherry Point have their speed brakes partially extended as they enter the landing pattern. VMF-122 conducted an intensive flying program with the FJ-2s and amassed a large number of hours in a relatively short period of time. (Larkin)

The first Marine squadron to re-equip with the FJ-2 was VMF-122 at Marine Corps Air Station Cherry Point, North Carolina, during January of 1954. This Fury is spreading its wings prior to a training flight during May of 1954. Squadron markings consisted of the code LC on the tail in Black, with Red and Gold fuselage and tail stripes. (USMC)



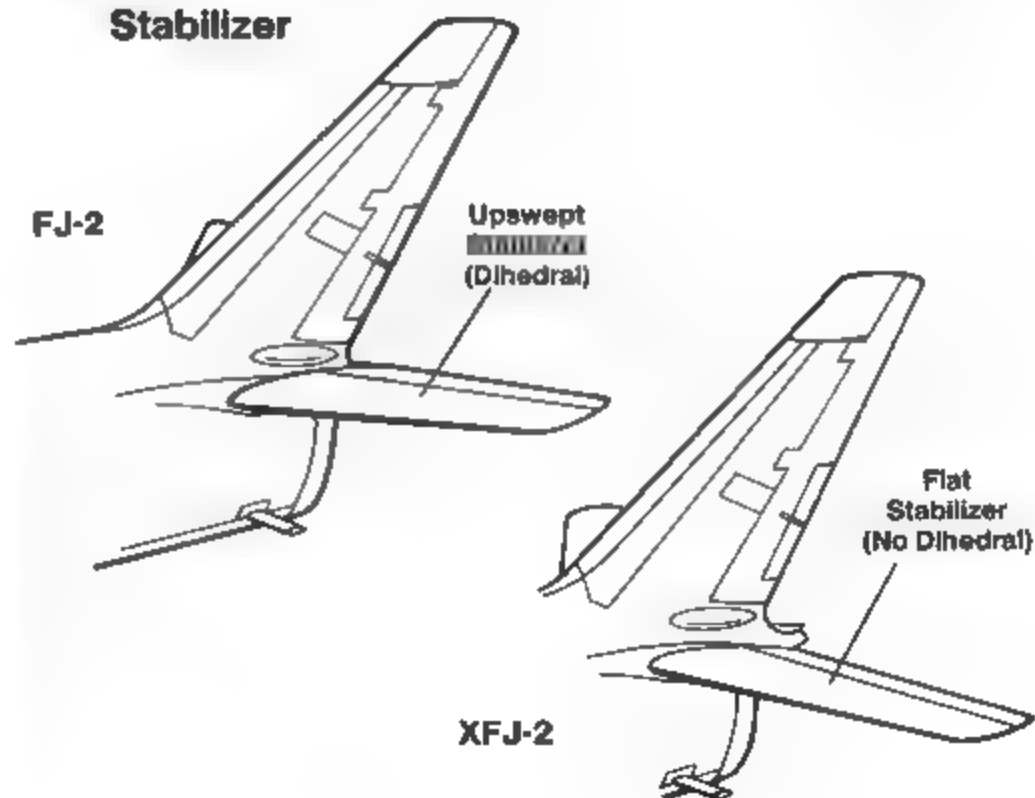


With its hook down and speed brakes deployed, a VMF-122 Fury makes its final approach to USS CORAL SEA in the Mediterranean. Despite a relatively successful cruise, the Fury was still not considered an acceptable carrier aircraft due to a number of shortcomings. (USN)

Following the HANCOCK tests VMF-235 deployed to NAS Atsugi, Japan, where the squadron remained until 1957. The squadron markings consisted of Red bands with White stars, on the nose, fuselage and fin. All lettering was in Black, while the fin tip was in Gray. (Larkin)



Stabilizer





The overall natural metal FJ-2s of VMF-232 carried Red stripes on the tail, fuselage and wings. Additionally, these aircraft carried an unusually shaped Red nose band. (Larkin)

In addition to the specially modified aircraft, other FJ-2s were also used during the HANCOCK tests. The catapult officer has given the launch signal to this FJ-2 of VMF-235. The tests showed that, even with the modifications, the FJ-2 was still not acceptable for general carrier duty. (USN)



During tests aboard USS HANCOCK (CVA-19), four FJ-2s of VMF-235 were modified to try and solve the Fury's carrier problems. This Fury was one of the modified aircraft which had a strengthened tail hook bumper and nose gear strut. (USN)





This overall natural metal Marine Fury has the fuselage mounted speed brakes partially deployed. The small dark area under the tail is the fuel dump pipe, which allowed the Fury to rapidly dump fuel to get down to landing weight for carrier landings. (Peter M. Bowers)



The pilot of MX-13, an FJ-2 of VMF-334, prepares to get out of his Fury. The squadron markings consisted of a Black stylized bird on the fuselage and tail with a Red lightning bolt running through the bird on the fuselage. (Larkin)

This FJ-2 was assigned to Headquarters and Maintenance Squadron (HAMS) 32 and has Blue Gray bands on the tail and fuselage with Black arrows inside the bands. (Larkin)



Reserve units began to receive FJ-2s during late 1956. Three color schemes were used for reserve Furies: overall natural metal, Gull Gray and White, and White and Orange. With the natural metal and Gull Gray schemes, the Orange reserve band was carried on the fuselage. These FJ-2s of NAS St. Louis, Missouri, are painted in the Gray and White (left) and Orange and White (right) schemes. (Larkin)



FJ-3

As a result of the various problems experienced with the FJ-2, North American began work on an improved design (NA-194) during March of 1952. This version was designed around a newly available power plant, the 7,650 lbst Wright J65-W-4 Sapphire engine. This engine was a license-built Armstrong Siddeley Motors Ltd Sapphire. Although somewhat heavier than earlier engines, it was felt the additional power would help improve performance and compensate for the weight of the specialized naval equipment. A little over a month after work had begun on the design, a contract was signed by the Navy for 389 aircraft, under the designation FJ-3.

There was no XFJ-3 prototype, instead the fifth production FJ-2 (BuNo 131931) was fitted with the J65 engine for trials and engine tests. This aircraft served as the prototype for the FJ-3 series and made its first flight on 3 July 1953. As expected, no major problems were encountered during test flights, and production began almost immediately at the Columbus plant, with the first production aircraft rolling off the line on 11 December 1953.

Externally, early production FJ-3s were almost identical to the FJ-2 except for an enlarged air intake to handle the increased airflow needed for the J65-W-4 engine. The slatted wings, four cannon armament, and hydraulic folding wing were all retained from the FJ-2. Internally, the FJ-3 carried 648 rounds of 20MM ammunition instead of the 600 rounds carried by the FJ-2 and additional armor plating was added to the cockpit. Other than these changes and some minor internal changes needed for installation of the new engine, there were no other major differences between the FJ-2 and FJ-3.

As in the case of the FJ-2, initial deliveries of the FJ-3 were slow, and by the Summer of 1954 only twenty-four had been accepted. In August of 1954 eight aircraft were assigned to NATC for the Fleet Introduction Program (FIP) consisting of an eight phase test cycle. Within one month, the aircraft had completed the program with pilots from both VC-3 and VF-173 conducting the flights. Few problems were encountered and these were minor in nature. Two FJ-3s were lost during the program, although both these losses were not due to any defect with the aircraft. In one case, foreign objects were ingested into the air intake, resulting in an engine explosion. The other Fury was lost when it ditched in the Patuxent River after the pilot had become lost and ran out of fuel.

Following the completion of the test cycle, VF-173 began to receive production FJ-3s during September of 1954. Based at NAS Jacksonville, Florida, the squadron was the first Navy Fury squadron assigned to a Carrier Air Group. After an intense work-up period, the squadron deployed aboard USS BENNINGTON (CV-20) during 1955. The carrier had just returned to duty following a disastrous fire which had occurred a year earlier.

As the level of operational experience with the FJ-3 increased, changes to the aircraft dictated by operational use began to be made on the production line. During July of 1955, the leading edge wing slats were deleted and replaced with an extended wing leading edge with a wing fence about half way along the span on each wing. The additional space provided by the extended leading edge was used to accommodate 124 gallons of fuel. A number of early production FJ-3s were later retrofitted with these extended leading edge wings.

Starting with the 345th production aircraft (BuNo 136118), the wings were modified to carry four additional underwing stores pylons for a total of six pylons. The new pylons allowed the FJ-3 to carry 500 and 1,000 pound bombs, rocket pods, fuel tanks, or the new Sidewinder air-to-air missile. Designed for air-to-air combat, the Sidewinder had an infrared sensor which sought out a target by the heat it gave off. This weapon provided the FJ-3 with a substantial increase in its air-to-air combat capability. Eventually, air-



There was no official XFJ-3 prototype (unlike earlier Fury variants). Instead, the fifth production FJ-2 Fury was re-engined with the J65-W-4 engine to serve as a prototype and engine test bed for the FJ-3 series. (USN)

Early production aircraft had wing slats while later production aircraft were modified with extended wing leading edges and wing fences. A number of older FJ-3s were retrofitted with these in their service life. This early Fury was assigned to NATC and was used aboard USS CORAL SEA for carrier trials. (USN)

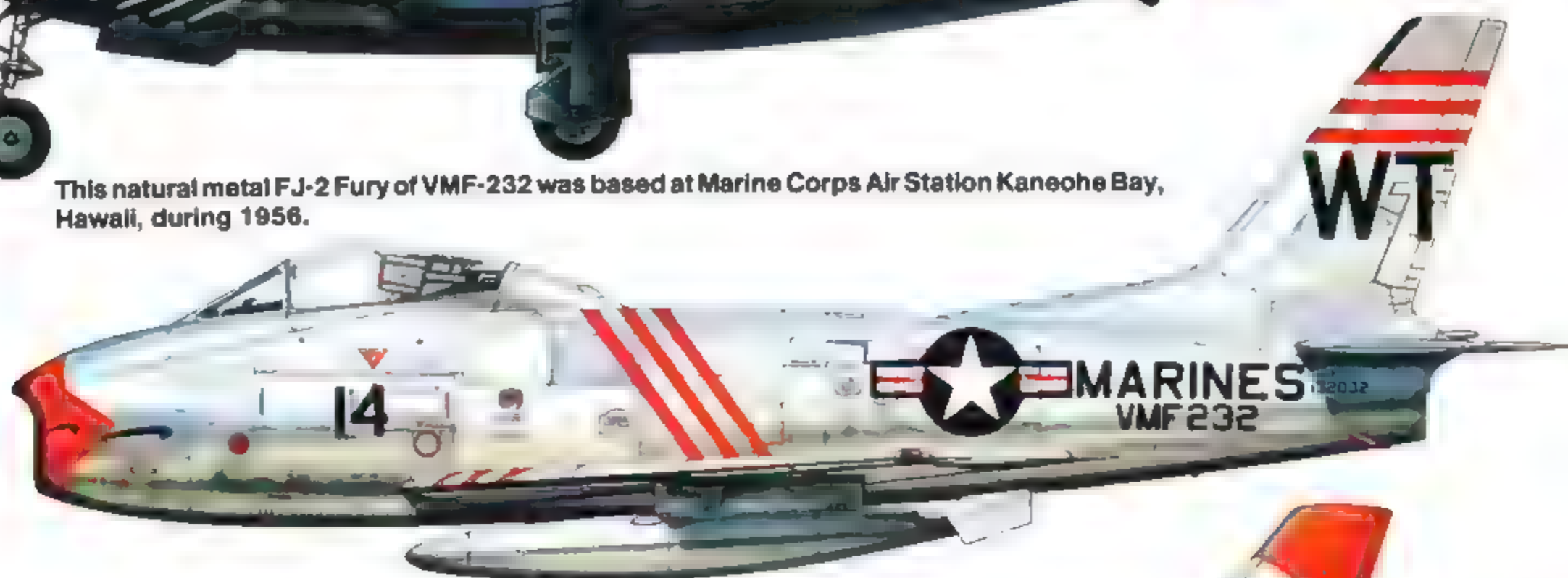




An FJ-1 Fury of VF-51 during the Bendix Jet Race of September, 1948. The Fury, flown by Commander Evan "Pete" Aurand, placed second.



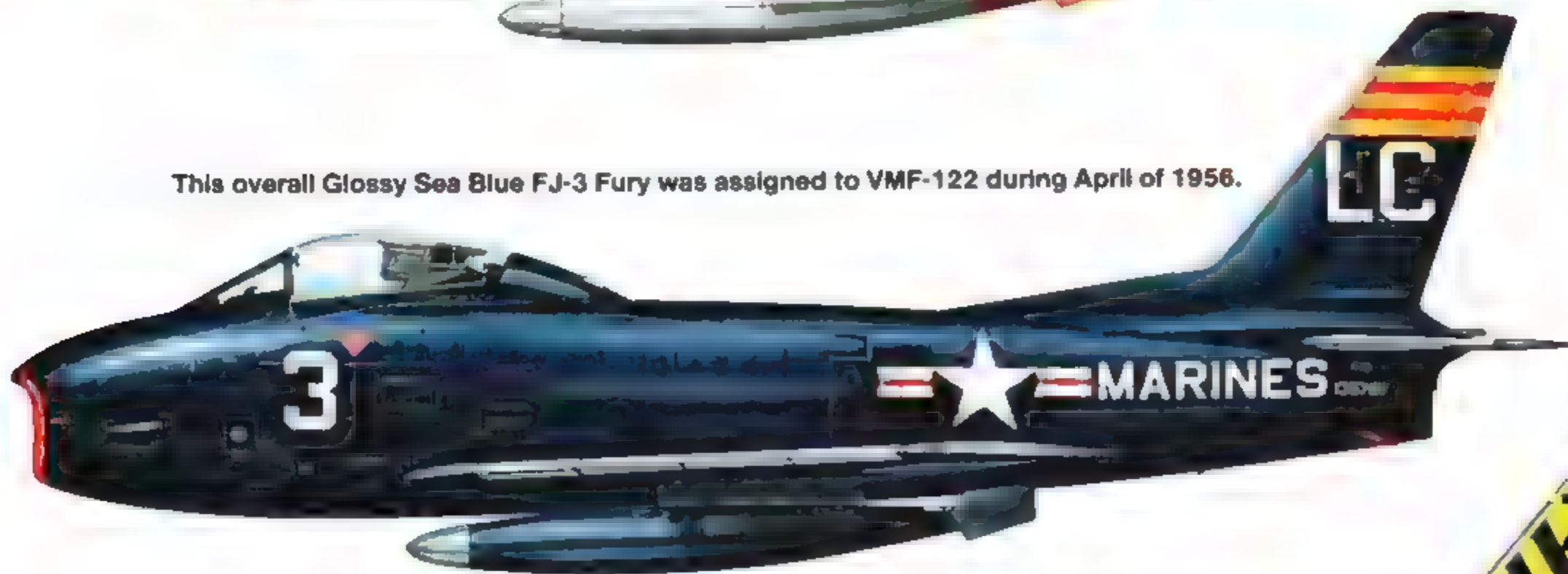
This natural metal FJ-2 Fury of VMF-232 was based at Marine Corps Air Station Kaneohe Bay, Hawaii, during 1956.



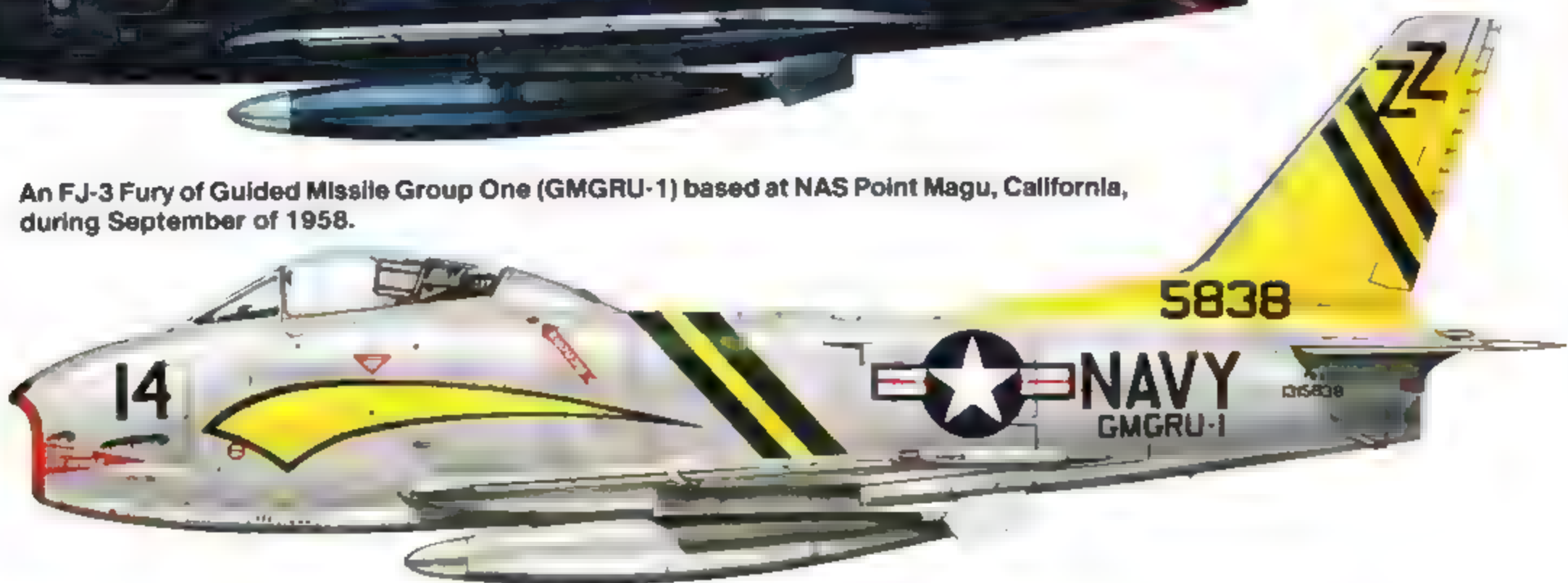
The Columbus Ohio Navy and Marine Air Reserve Unit flew this FJ-2 Fury during the Spring of 1957.



This overall Glossy Sea Blue FJ-3 Fury was assigned to VMF-122 during April of 1956.



An FJ-3 Fury of Guided Missile Group One (GMGRU-1) based at NAS Point Magu, California, during September of 1958.

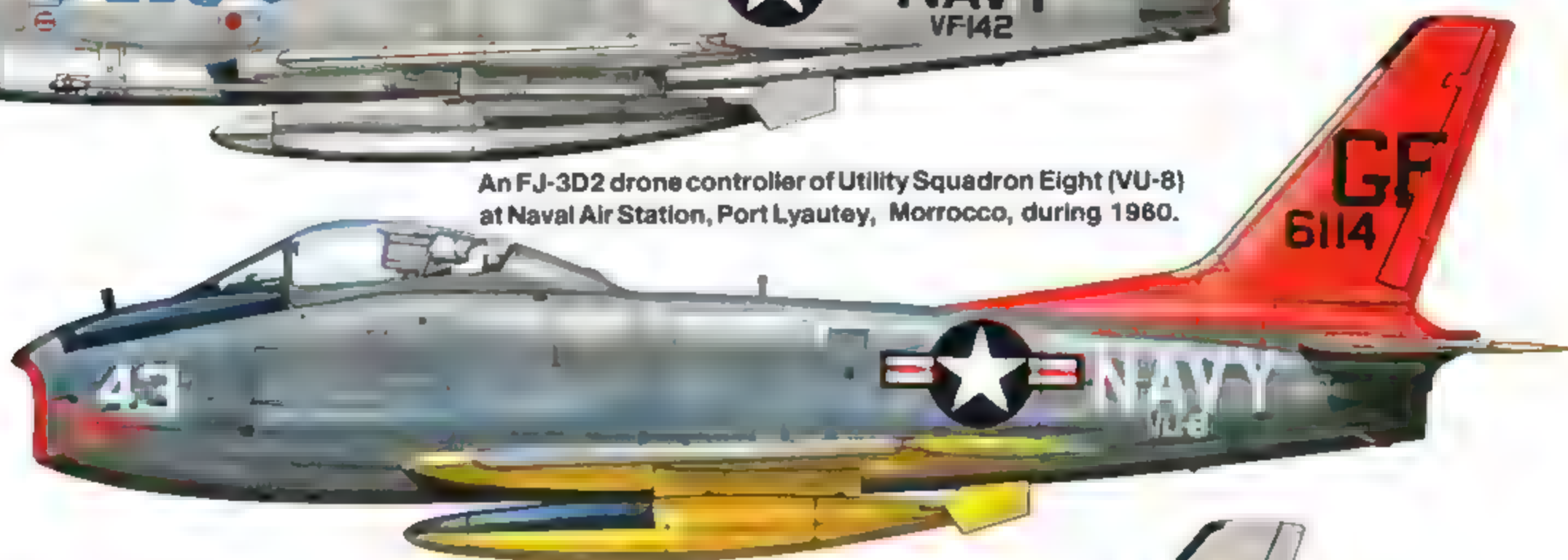


LT JG E. L. GERONIME

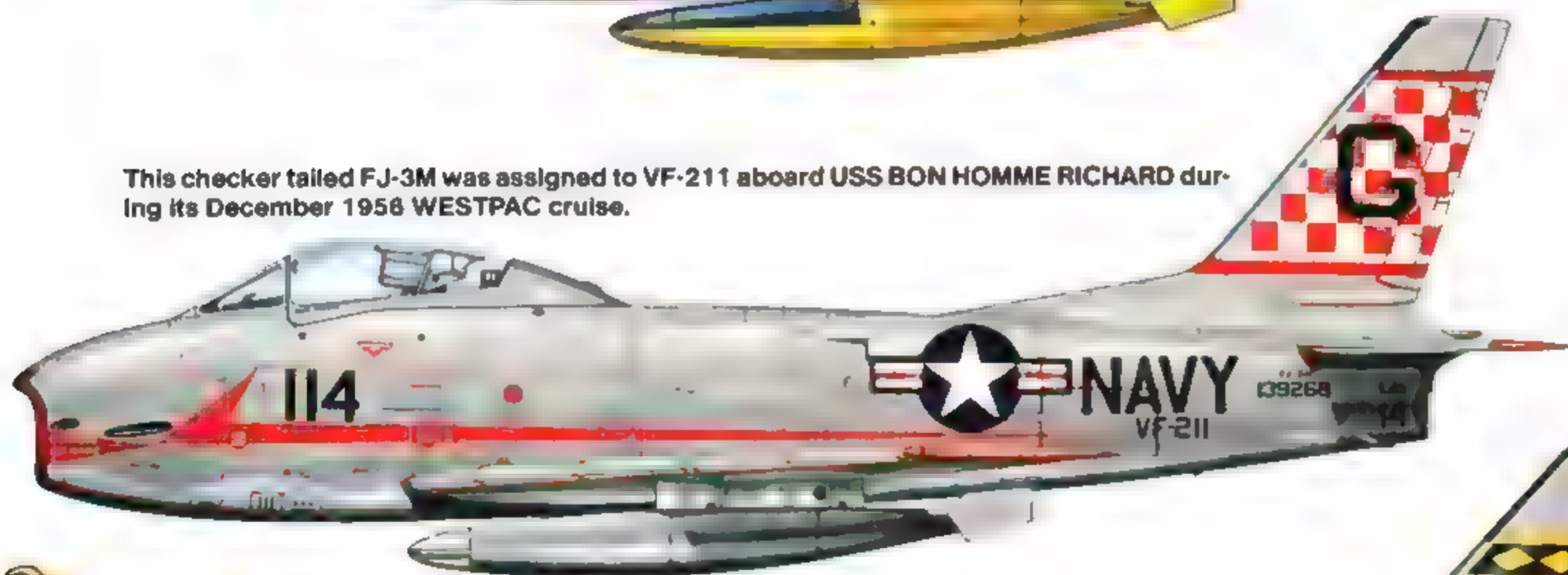
LTJG E. L. Geronime of VF-142 flew this FJ-3M Fury during 1957.



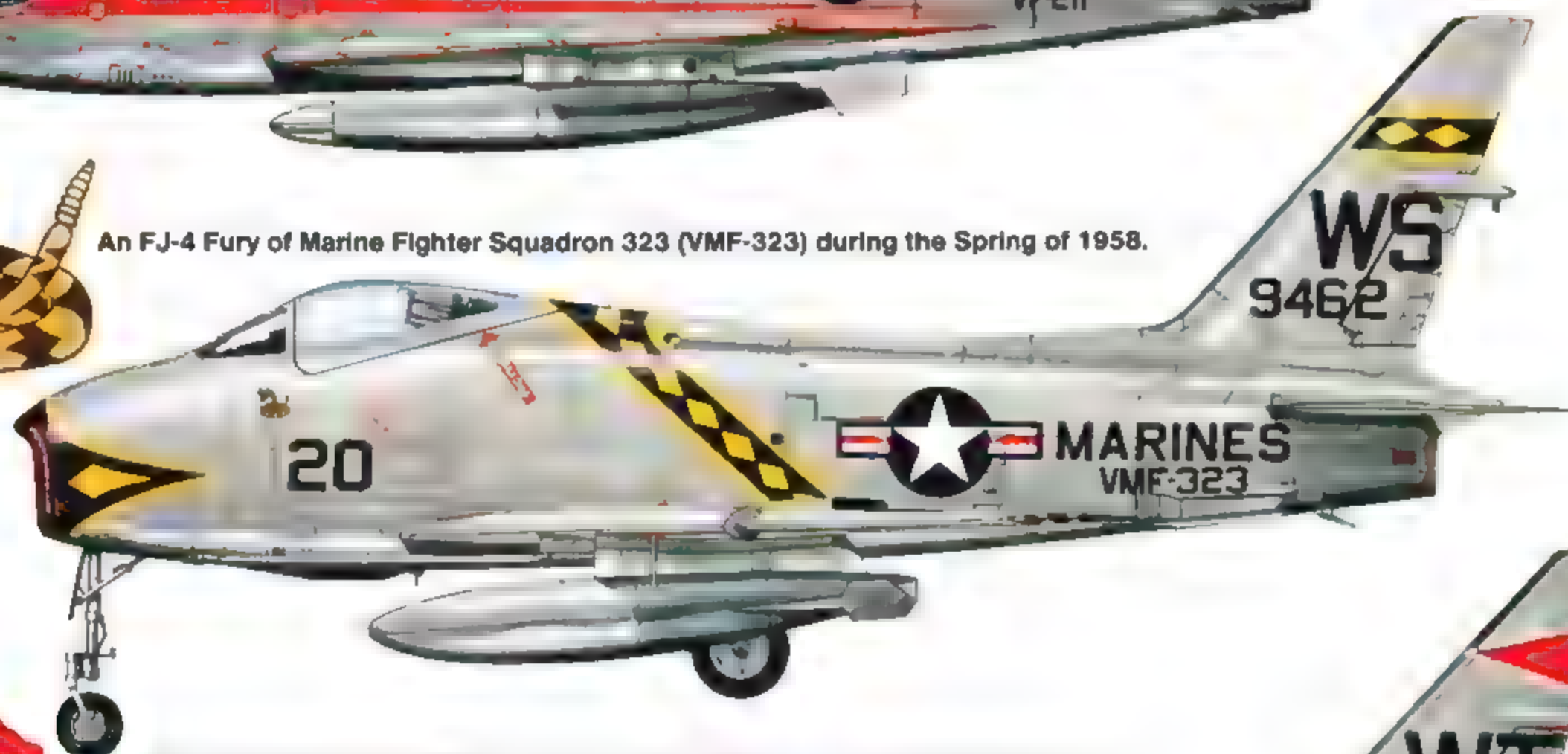
An FJ-3D2 drone controller of Utility Squadron Eight (VU-8) at Naval Air Station, Port Lyautey, Morocco, during 1960.



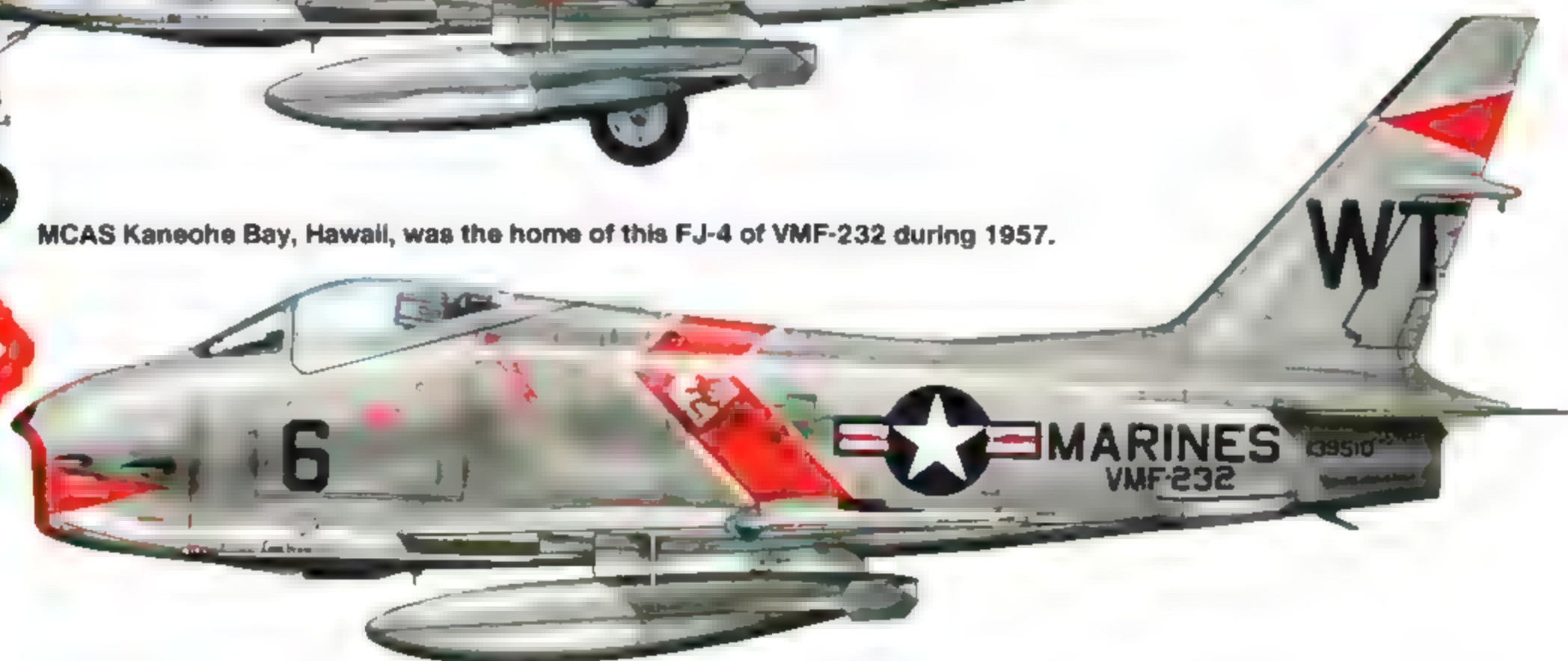
This checker tailed FJ-3M was assigned to VF-211 aboard USS BON HOMME RICHARD during its December 1958 WESTPAC cruise.



An FJ-4 Fury of Marine Fighter Squadron 323 (VMF-323) during the Spring of 1958.



MCAS Kaneohe Bay, Hawaii, was the home of this FJ-4 of VMF-232 during 1957.



craft configured to carry the Sidewinder were re-designated as FJ-3Ms (M for missile). The first unit to be equipped with the FJ-3M was VF-211, which deployed for a Western Pacific cruise aboard USS BON HOMME RICHARD (CV-31) during August of 1956.

During February of 1956, the initial production contract for the FJ-3 was completed by North American and work began on a second contract, which had been received during March of 1954 for an additional 214 aircraft. This contract was cut to sixty-nine aircraft, but was later increased by eighty, bringing the second production contract to a total of 149 aircraft. Work at the North American plant continued throughout the Winter and Spring of 1956, with the final aircraft, an FJ-3M, being delivered in August of 1956. Total production of the FJ-3 and FJ-3M was 538 aircraft.

Following the introduction of the FJ-3 into front line service by VF-173 during May of 1955, other Navy and Marines units were quickly re-equipped with the FJ-3 and -3M. Eventually, twenty-three squadrons would operate either one or both of the FJ-3 variants. These squadrons were almost evenly split between the Atlantic (11 squadrons) and the Pacific (12 squadrons) fleets. Nineteen squadrons were Navy, while the remaining four were Marine units. The FJ-3 came into service during a period when the Navy was making a number of important transitions and it was involved in several of these.

The FJ-3 was one of the first missile carrying aircraft to operate with the fleet and was also used to test the new mirror deck landing system, which had been designed to replace the paddles used by the Landing Signal Officer (LSO). The system was first tested aboard USS BENNINGTON during August of 1955 by an FJ-3 assigned to VX-3. It quickly proved to be far superior to the old system and within a short time became standard equipment on American aircraft carriers. An FJ-3 was also the first aircraft to land on USS FORRESTAL (CVA-59), the first of the supercarriers, designed from the outset for jet operations.

Eight production FJ-3s were assigned to NATC for the Fleet Introduction Program where they were put through eight operational test cycles. This FJ-3 was the third production aircraft which was used for carrier qualifications. Early production FJ-3s differed from the FJ-2 in having a larger air intake. (USN)



In general the FJ-3 was far superior to the FJ-2, both in performance and handling characteristics. While heavier, the additional power more than made up for the increase in weight. Although only marginally faster, both at sea level and altitude, the FJ-3's climb rate was over 1,200 feet per minute faster and its service ceiling was over 7,000 feet higher. Late production FJ-3s were also equipped with an in-flight refueling probe mounted under the port wing outboard of the middle pylons. The addition of the extra fuel in the wing and provision for inflight refueling gave the FJ-3 a far greater combat radius and ferry range than the FJ-2. Takeoff distance was also cut down, as the FJ-3 could get into the air in two-thirds the distance required for an FJ-2.

The FJ-3s did not remain in front line service long. Newer fighter types were coming into service, such as the F8U Crusader, and by the late 1950s the FJ-3 had been reassigned to second line duties. Some were modified as chase and control aircraft for the Regulus ship-to-shore long range missile or served aboard carriers as missile controllers. Aircraft modified to perform this duty were redesignated as FJ-3Ds and assigned to Utility Squadrons (VU) or Guided Missile Groups (GMGRU). These units provided detachments of aircraft for temporary duty on carriers or at Navy bases.

By the 1960's the only FJ-3s remaining in service were those assigned to Navy or Marine Reserve units or aircraft used as instructional airframes at various air stations. The Reserves did not keep their aircraft long and by the mid-1960s the remaining flyable FJ-3s were placed in storage at Davis Monthan. The aircraft were eventually sold for scrap during the early 1970s.

Maintenance personnel work on an overall Glossy Sea Blue FJ-3 of VC-3, one of the Navy units involved in the FIP. The squadron markings consist of a White tail band with Glossy Sea Blue stars. All lettering and codes are in White. (USN)





Early FJ-3s were delivered in an overall Gloss Sea Blue color scheme with all lettering, numbers and stencils in White. This Fury of VF-33 has a White lighting bolt on the fuselage, a White nose band and White rudder with Gloss Sea Blue stars. (USN)



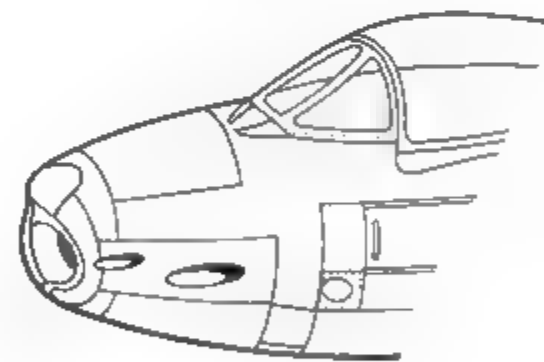
This Fury of VF-51 carried a Red flash running the length of the fuselage in addition to the three White fuselage stripes. The leading edges of the vertical fin, wing and horizontal stabilizer were natural metal. (Larkin)

A flight of FJ-3s of VMF-122 fly over North Carolina during the Spring of 1956. VMF-122, the first Marine unit to operate the FJ-2, was also the first Marine squadron to re-equip with the FJ-3. The tail bands are Gold and Red. (USMC)



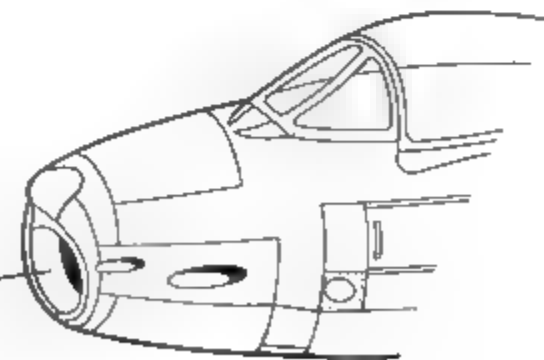
Air Intake

FJ-2



FJ-3

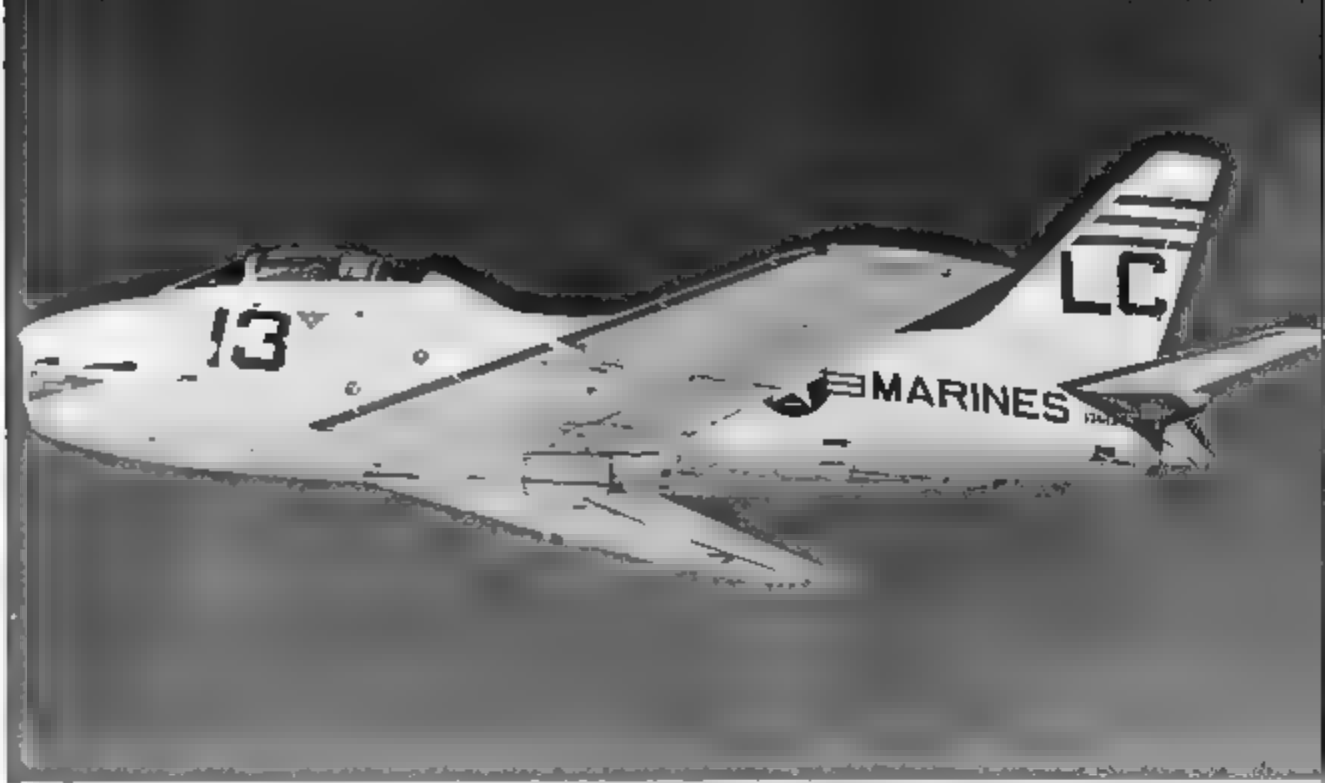
Deeper
Air Intake





This early production FJ-3 of VF-154 carried a Red lightning bolt, outlined in White on the nose, a White outlined Red band on the fuselage and White outlined Red tail stripes. All lettering was also in White. (Larkin)

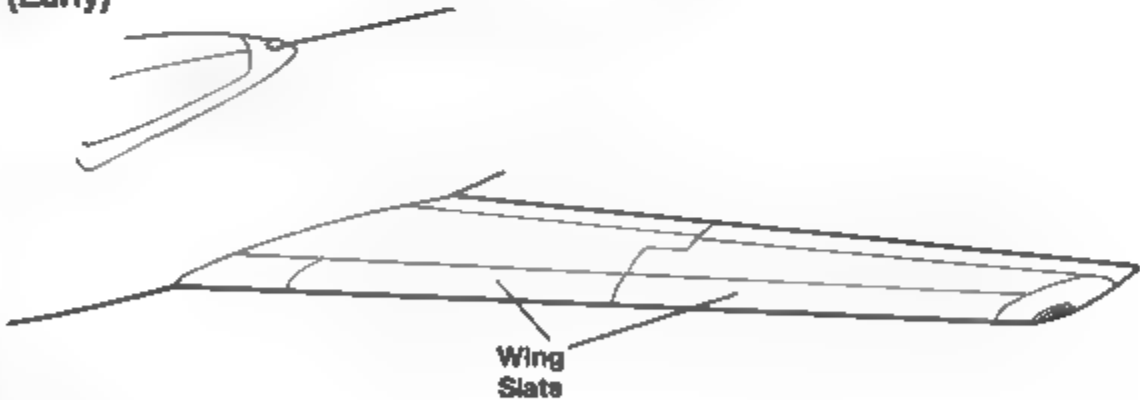
During the 1950s, Navy aircraft carried some highly colorful paint schemes. This trio of FJ-3s of VF-33 took part in the second annual Fleet Gunnery Meet held at El Centro, California. The squadron markings are a Yellow lightning bolt outlined in Gloss Sea Blue and a Yellow nose band and rudder with Blue stars on the rudder. (USN)



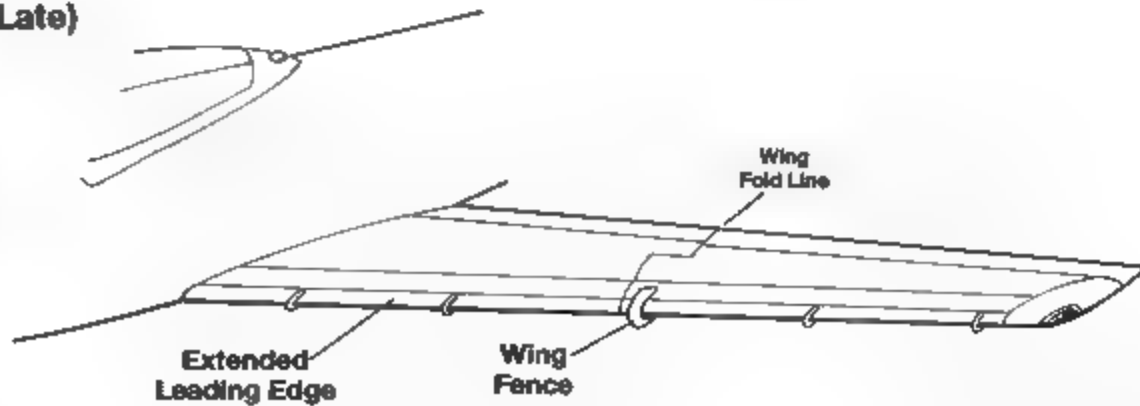
During 1955 the Navy decided to change from the overall Gloss Sea Blue camouflage to a camouflage consisting of Matt Gull Gray upper surfaces over Gloss White undersurfaces. The new camouflage was carried by FJ-3s assigned to VMF-122. This FJ-3 is a late production aircraft with extended wing leading edges and a single wing fence. (USMC)

Wing Development

FJ-3 (Early)



FJ-3 (Late)





After the switch to the Gull Gray and White camouflage, VF-154's squadron markings were changed to Orange with the lightning bolt and tail stripes now being outlined in Black. This FJ-3 has been retrofitted with the wing fences and extended wing leading edges. (Larkin)



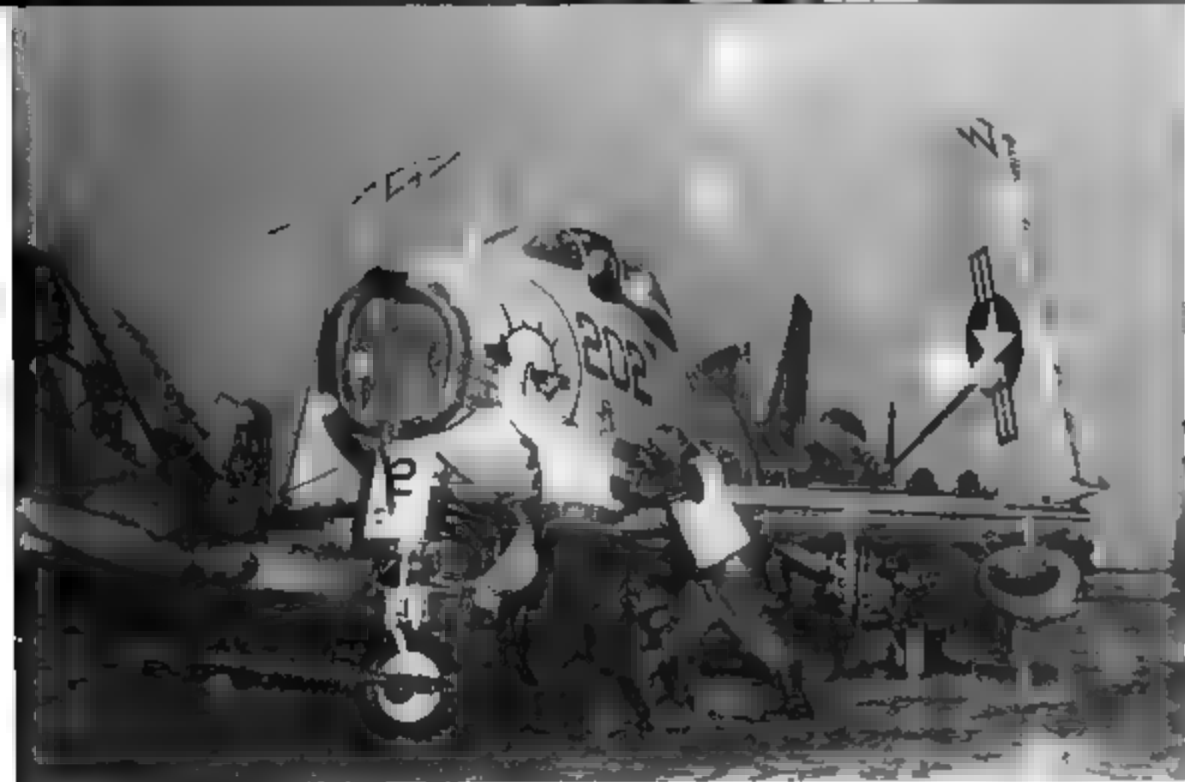
An FJ-3 of VF-21 lands aboard USS FORRESTAL (CVA-59) during early 1956. VF-21's squadron markings are Yellow and Black. An FJ-3 Fury was the first aircraft to land aboard FORRESTAL, the Navy's first supercarrier. (USN)

Deck crewmen aboard USS SHANGRI-LA (CVA-38) ready a Fury for launch from the port side catapult. Eventually, some twenty-three Navy and Marine squadrons were equipped with FJ-3 and FJ-3M and the aircraft became a common sight throughout the fleet. (USN)



The FJ-3 could be fitted with a refueling probe mounted under the port wing near the outboard pylon. The squadron markings on the tail and fuselage of these FJ-3s of VF-191 are in Red outlined in White. The Fury in the foreground is carrying a drop tank still painted in Gloss Sea Blue. (USN)





Carrier operations require a great deal of brute strength under harsh conditions. Deckhands manhandle an FJ-3 of VF-173 into position for launch during a snowstorm aboard USS FRANKLIN D. ROOSEVELT (CVA-42). The ram's horn marking on the nose is Yellow outlined in Black. (USN)



Four Marine squadrons were equipped with FJ-3a, including VMF-333. VMF-333 markings consisted of a White fuselage band, bordered in Green, with Green shamrocks. Both the forward and rear portions of the drop tank were also in Green, while the tank fins were Green and White. (Larkin)

A number of commands tried to cut the costs of fancy unit markings. These FJ-3s of VF-143 carry service and unit identification markings only. The uppersurfaces of all control surfaces are in Gloss White. (USN)

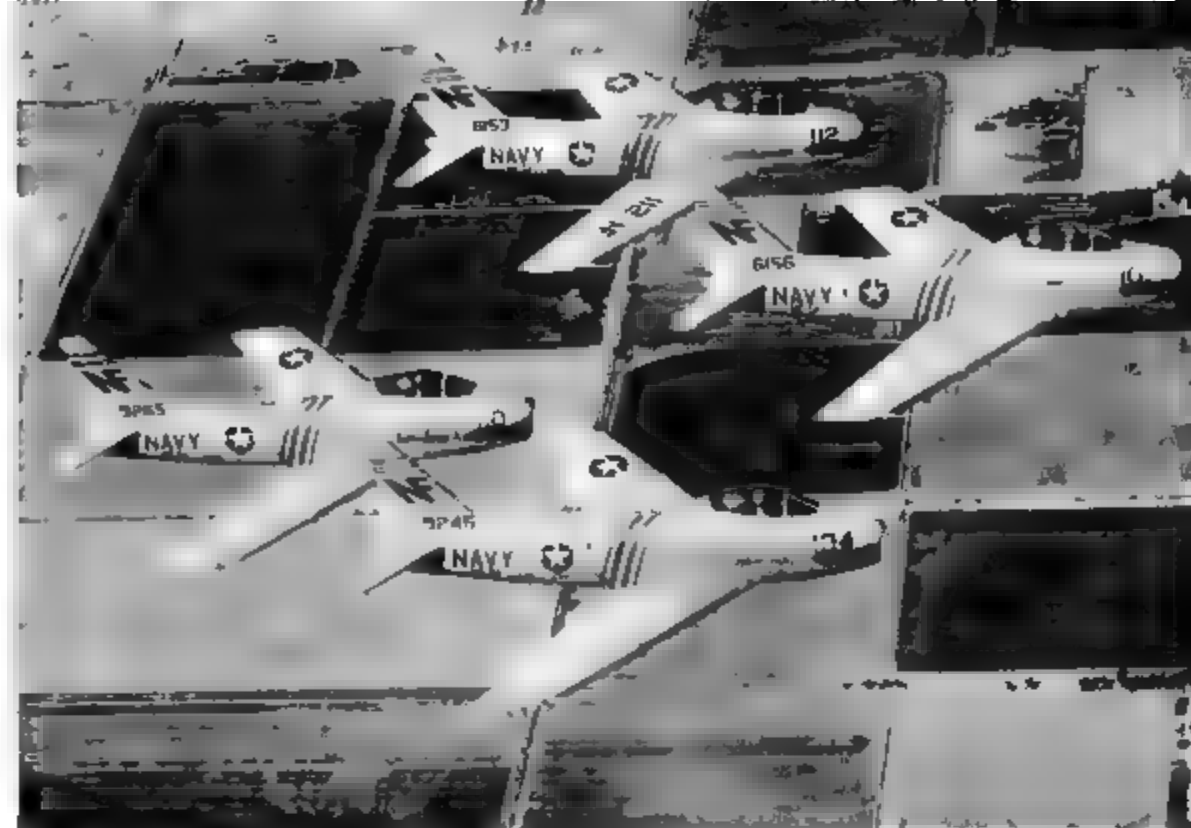
In addition to fighter units, a number of Marine Headquarters and Maintenance Squadrons also received FJ-3s. This Fury is from H&MS-31 and carries no special markings other than the unit identification code DV on the fin. (Larkin)





This FJ-3 of H&MS-32 at MCAS Beaufort, South Carolina, during September of 1958, carries Black arrow heads on the Blue Gray fuselage and tail band. Parked behind it is a Fury assigned to VMF-333. (Larkin)

Some of the most colorful squadron markings in the Navy were those carried by the FJ-3s of VF-91. The squadron markings consisted of White wing tip and tail bands bordered in Red with Red ovals inside the bands. The number and flash on the fuselage were also in Red with no outline. The broad Red tail band carried the air wing identification code in Black outlined with White. (Larkin)



A flight of FJ-3s of VF-51 fly over the California countryside during the Spring of 1957. These aircraft are based at NAS Miramar, just outside San Diego, California. These aircraft would later be modified to carry Sidewinder air-to-air missiles. (USN)

This late production FJ-3 of VF-143 was assigned to Air Task Group (ATG) -2 during the Fall of 1956. The flash on the fuselage and tail are Red while the W on the tail is in Black. (Larkin)

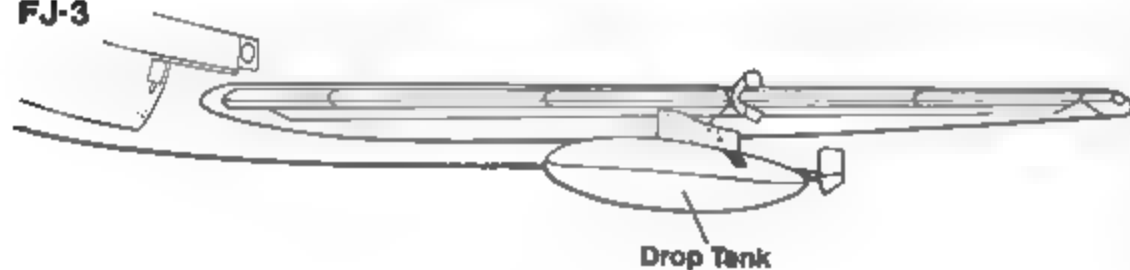




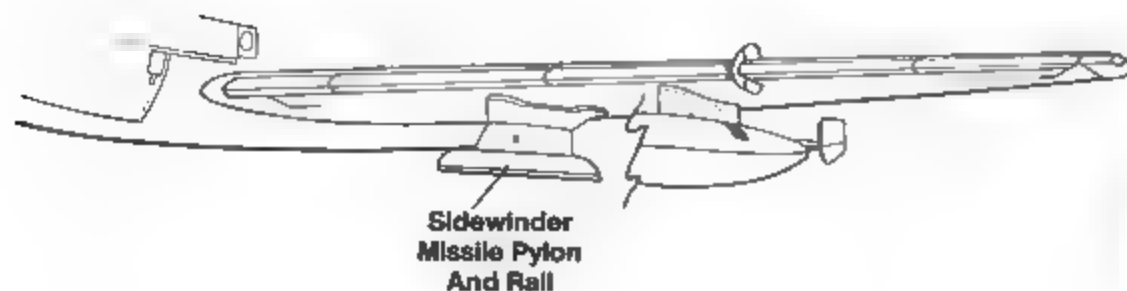
Beginning with the 345th FJ-3 off the production line, the aircraft was modified to carry AIM-9B Sidewinder air-to-air missiles on the inboard pylon. The Sidewinder greatly enhanced the Fury's capability in the air defense role and was retrofitted to earlier production FJ-3. Aircraft with missile armament were redesignated FJ-3Ms. (USN)

Armament

FJ-3



FJ-3M



An FJ-3M of VF-84 is prepared for launch from USS RANDOLPH (CVA-15) in the Mediterranean during May of 1959. The Fury carries Sidewinder missile launch rails on the inboard pylons and a refueling probe. (USN)

An FJ-3M of VF-211 is ready for launch from the starboard catapult aboard USS BON HOMME RICHARD (CVA-31). The Fury carries AIM-9B Sidewinders on the inboard pylons and drop tanks on the outboard pylon. Fury drop tanks had an oval cross section unlike the round F-86 tanks. (USN)





The FJ-3Ms of VF-73 carried a similar checkerboard to that carried on the Furies of VF-211, but in Blue instead of Red. Although no Sidewinders are carried, this aircraft is an FJ-3M and carries the designation under the tail above the BuNo. (USN)



A number of FJ-3 and -3Ms were assigned to utility squadrons for a variety of missions and roles. This Fury of VU-10 was flying over the U.S. Naval base at Guantanamo Bay, Cuba, during early 1962.

Two FJ-3Ms of VF-84 wait to take their position on the catapults aboard USS FORRESTAL during a Med cruise. Squadron markings consist of Black arrows on a Yellow band outlined in Black. The plane guard ship in the background is USS AULT (DD-696) a Sumner class destroyer. (USN)



Fury pilots of VF-84 man their aircraft in preparation for a launch aboard USS RANDOLPH during September of 1958. The Fury in the foreground has Sidewinder missile rails on the inboard pylon and the pilot's helmet is on the refueling probe. (USN)





Two FJ-3D drone controllers work in conjunction with a Lockheed TV-2 Shooting Star, as chase and control aircraft for a Regulus surface-to-surface missile during a missile test flight. The FJ-3D was outfitted with special electronics to control drone aircraft.



Only two Marine squadrons were equipped with FJ-3Ms, one in the Pacific and one in the Atlantic. VMF-235 transitioned to the FJ-3M during mid-1956. The squadron markings were Red bands with White stars on the nose, fuselage and tail. (Larkin)

This early production FJ-3 was assigned to the Navy ordnance test facility at China Lake, California. The aircraft carries target tow colors and markings which consist of an Engine Gray fuselage, with a Orange-Yellow tail and Yellow wings with Red bands. (USN)



This colorful FJ-3M of VF-24 carries Commander Carrier Air Group (CAG) markings on its rudder, along with a Red stripe at the top and bottom of the tail. The rudder colors are (top to bottom): White, Green, White, Yellow, White, Blue, White. (Larkin)





This Marine reserve FJ-3 Fury was based at South Weymouth for use by reserve pilots. The aircraft is believed to carry an International Orange and Gray color scheme. (Larkin)



A reserve FJ-3M sits on the ramp of NAS Willow Grove during the Summer of 1960. The areas of worn paint on the fuselage are probably where the markings of its former fleet unit were removed. (Larkin)

Numerous Reserve units flew the FJ-3 and -3M during the late 1950s and early 1960s. This Orange and White FJ-3 was based at NAS Willow Grove, Pennsylvania, during 1960. Since both Navy and Marine pilots flew the aircraft, the Fury carried dual service markings. (Larkin)



This FJ-3M of VF-143 sits on the ramp at Davis Monthan Air Force base after being readied for storage during August of 1960. By the early 1960s only a few support units and Naval Air Reserve squadrons were operating the FJ-3 and FJ-3M; all others had been retired. (Larkin)



FJ-4

Preliminary design work on the final variant of the Fury series began during February of 1953 under the direction of North American engineer Frank Compton. During early June, the project was formalized with the Navy issuing a contract for two NA-208 prototypes and 132 NA-209 production aircraft under the designation FJ-4. The contract was modified during July of 1954 with an additional forty-five aircraft being added to the order. Although two prototypes were built, they were never designated as XFJ-4s, simply being referred to as FJ-4s.

The FJ-4 prototypes bore little resemblance to the earlier FJ-2 and FJ-3. North American's engineers had completely redesigned the fuselage, which was deeper and shorter than any previous Fury. The fuselage also had a dorsal spine which ran from the cockpit to the base of the fin and rudder. The fin was much taller than the FJ-2/3 and was fitted with a shorter, redesigned rudder. An increase in cockpit armor plating cut down on the amount of ammunition the FJ-4 could carry from 648 rpg (FJ-3) to 576 rpg (FJ-4).

The two prototypes were powered by the 7,650 lbst Wright J65-W-4 engine; however, it was intended that production aircraft would be powered by 7,700 lbst Wright J65-W-16A turbojet engines.

The wings were also redesigned, being increased in span by two feet and in wing area by a little more than thirty-six square feet. The thickness of the wing was reduced and used a multi-spar design, which enabled it to absorb the same amount of stress as earlier Fury fighters with far less weight. The wing skinning, milled from a solid aluminum plate, was the largest rolled by any manufacture up to that time. The wing also included mid-span ailerons, high lift flaps and drooped wing leading edges. The prototypes featured a levered landing gear which was increased in track by two and one half feet over the FJ-3. Four underwing pylons were fitted, with the inboard stations being capable of carrying either drop tanks or ordnance up to 2,000 pounds. The outboard stations were stressed to accommodate up to 500 pounds of stores. Additionally, all four stations were wired to carry Sidewinder air-to-air missiles. Unlike the earlier FJ-3M, missile armed FJ-4s never carried the M suffix.

The space gained in the redesigned fuselage and wing allowed the FJ-4 to carry 50% more fuel than the earlier FJ-3, giving it a combat range of nearly 1,500 miles. Its speed was comparable to the FJ-3, however, its performance in rate of climb (7,660 ft/min) and service ceiling (46,800 feet) were somewhat less than the lighter FJ-3. Navy officials felt that the increase in range more than offset these losses. In addition, the electronics in the FJ-4 allowed the aircraft to carry out its attack mission under all weather conditions.

The first prototype made its maiden flight on 28 October 1954. During this and subsequent manufacturer's test flights, no major problems were encountered. Once testing was completed, the Navy cleared the FJ-4 for production with the first production machine coming off the Columbus assembly line during February 1955.

The first of two FJ-4 prototypes during its official rollout at the North American Plant in Columbus, Ohio, during the Fall of 1954. As with the earlier FJ-3 there was no XFJ-4 prototype designation. (NA)





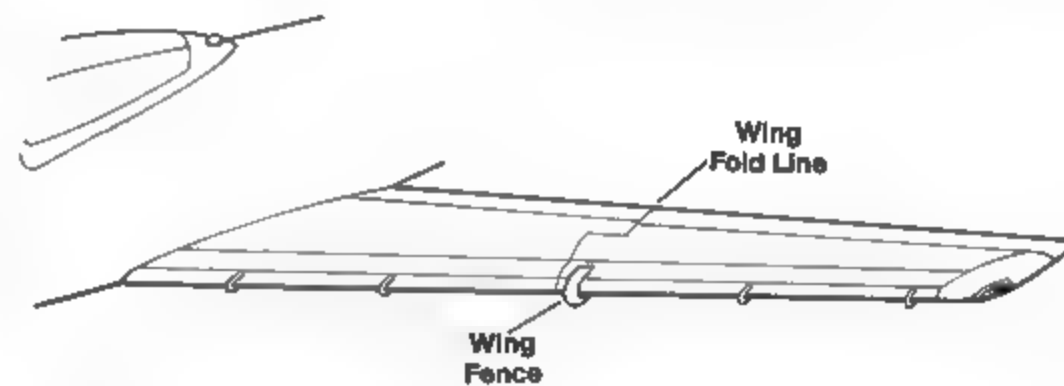
One of the FJ-4 prototypes prepares to take off from North American's Columbus facility. While the FJ-2 and FJ-3 were similar to one another, the FJ-4 was a completely new aircraft with little in common with the earlier Furies. (NA)

The second production FJ-4 had the short fin used on the prototypes. The FJ-4 differed from the earlier Furies in a number of ways. It had a deeper fuselage, a dorsal spine that ran from the cockpit to the fin, shorter/wider wings and a taller fin. (NA)

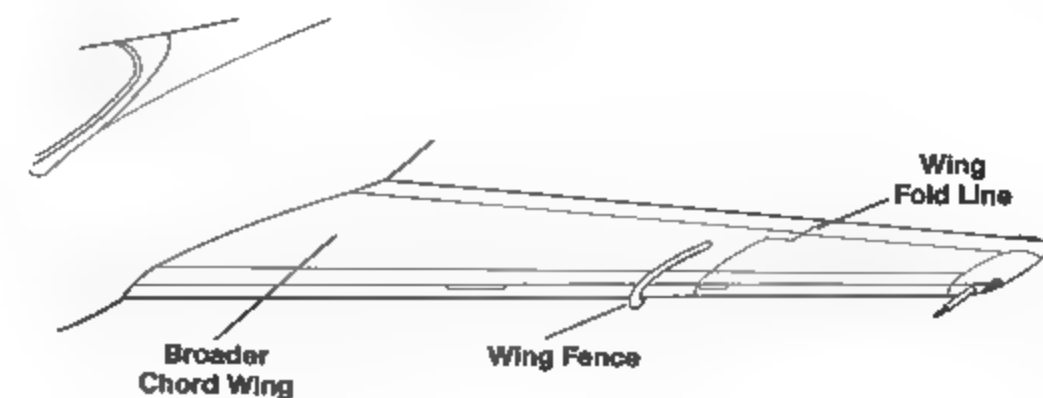


Wing Development

**FJ-3
(Late)**



FJ-4





Although FJ-4s were operated by the Navy, the majority of aircraft were used by Marine fighter squadrons. Two FJ-4s of VMF-323 practice refueling by taking on fuel from a North American AJ-2 Savage of VAH-16. (USN)

The FJ-4 had a fifty percent greater internal fuel capacity than the FJ-3 and was also equipped with an in-flight refueling probe. The trans-oceanic range of the FJ-4 was demonstrated in the Fall of 1958 when two Marine squadrons crossed the Pacific. This Fury of VMF-354 carries a refueling probe under the port wing. (Matt)



A flight of FJ-4s of VMF-235 in formation over California during late 1956. The aircraft carry Red bands with White stars on the tails, fuselage and nose. (USMC)

Three FJ-4s of H&MS-11 carry out a training mission near Mount Fuji, Japan, during the Summer of 1957. The aircraft were assigned to the 1st Marine Air Wing, home based in Japan. (USMC)





A number of FJ-4s were assigned to the two Guided Missile Groups (GMORU) (one in the Atlantic and one in the Pacific). This Fury was assigned to GMGRU-1, which provided detachments for use on Pacific fleet carriers. Originally assigned to NAS North Island, the unit later moved to NAS Barbers Point, Hawaii. (Larkin)



Utility squadrons also operated a number of FJ-4s. This FJ-4 of VU-7 is parked on the ramp at NAS North Island, California, during the Spring of 1960. The aircraft carries target towing colors and a target reel under the wing. (Larkin)

The first Marine FJ-4 squadron was VMF-451 which operated from NAS Atsugi, Japan, during the mid-1950s. the squadron markings were Blue bands with White stars on the nose, tail and fuselage. (USMC)



By the end of 1962, the FJ-4 had been phased out of front line use and were being operated mainly by reserves squadrons. This FJ-4 was assigned to the Naval Reserve Air Unit (NRAU) at NAS Memphis during the Summer of 1962. (Larkin)



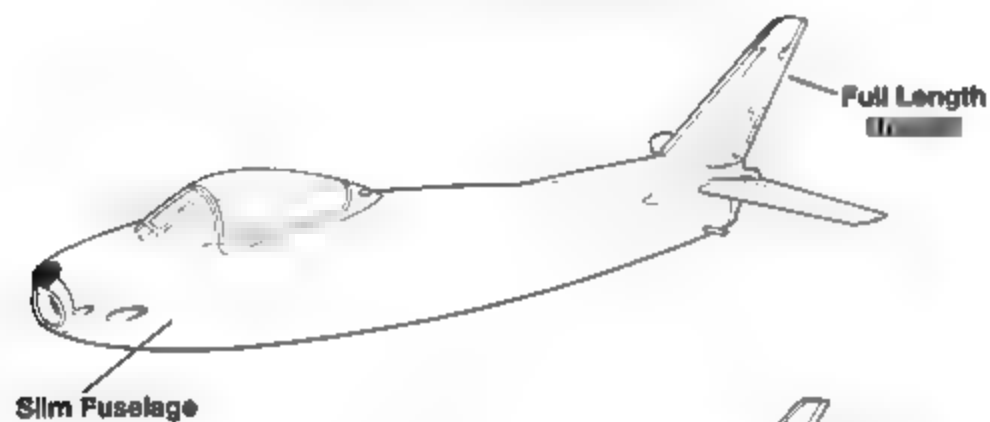


This FJ-4 was used to test the buddy refueling system and is carrying two buddy stores on the outboard wing pylons. The system was introduced into operational service by the FJ-4Bs of VA-151. (USN)

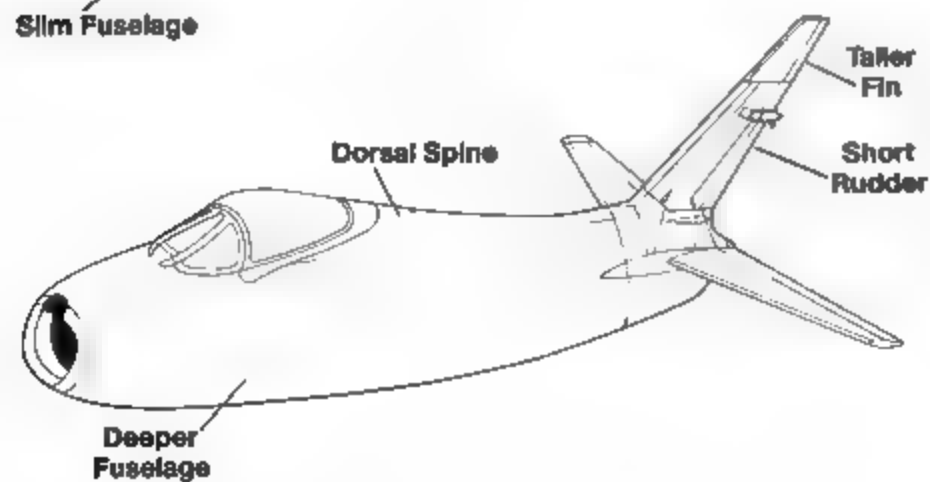
Two FJ-4s of VU-5 fly formation with a Lockheed P2V Neptune drone launch aircraft. Both Furies have opened their speed brakes in order to maintain formation with the Neptune. Once the drones are launched, they will be controlled by the Furies. (USN)

Fuselage Development

FJ-3



FJ-4



FJ-4B

Like the earlier variants of the Fury, production of the FJ-4 was initially slow and by the end of 1955, seventeen aircraft had been completed. An additional 113 would follow during 1956, with the remainder of the initial production contract being completed during March of 1957. While production slowly increased on the FJ-4, North American engineers were working on a modification of the FJ-4 to improve its capabilities in the ground attack role. The improved FJ-4 would be configured with additional underwing stores and other improvements under the designation FJ-4B.

The FJ-4B differed from the FJ-4 in a number of ways. It featured a strengthened wing which could carry six underwing ordnance stations. The fuselage was modified with an additional set of speed brakes, positioned behind and below the main fuselage speed brakes. The second set of speed brakes had two external reinforcing channels and extended approximately halfway back under the tail surfaces. A bungee cord automatically pulled these brakes closed whenever the landing gear was extended. The addition of these extra speed brakes helped slow the aircraft considerably at low level, allowing for more precise bomb runs.

The FJ-4B was also equipped with the Low Altitude Bombing System (LABS) which allowed it to deliver tactical nuclear weapons. This same feature had been installed earlier on late production F-86Fs and North American's new F-86H (roughly the Air Force counterpart to the FJ-4B). This system allowed the aircraft to approach the target at low level, begin a steep climb into a loop, and release the weapon near the top of the loop. The bomb then continued toward target while the pilot executed an Immelmann turn to exit the area and escape the blast. The LABS automatically computed the exact time of bomb release, both to ensure hitting the target and to allow the pilot time to get clear. Although never used in combat, the system worked exceptionally well in exercises.

The first production FJ-4B was delivered by North American on 4 December 1956. The initial production run of twenty-five aircraft was covered as part of the earlier FJ-4 contract. The Navy then placed two additional contracts, the first for forty-six aircraft (November of 1954) and the second for 184 aircraft (April of 1956). In the event, thirty-three were cut from the last contract, which brought total FJ-4B production to 222 aircraft.

Following its introduction into fleet service during 1957, the FJ-4B had a number of additional changes incorporated into the aircraft. To extend its range, a Buddy refueling package was designed that allowed the FJ-4B to take full advantage of its in-flight refueling capability. The Buddy store was a fuel tank which contained a hose and drogue refueling system. This allowed one FJ-4 to refuel another with some 3,000 pounds of fuel, extending the receiving aircraft's combat radius approximately fifty per cent. Following a successful series of flight tests, the system was put into operational use by VA-151 during June of 1958 while deployed aboard USS BENNINGTON.

During September of 1957, one of the more significant improvements to the FJ-4B was tested when an aircraft of VX-4 fired the first Martin ASM-N-7 Bullpup air-to-surface radar guided missile. The Bullpup had been designed as a result of lessons learned during the Korean War where a large number of Navy and Marine aircraft had been lost to ground fire over North Korea. As a result the Navy began to develop an air-to-surface missile which would allow an aircraft to hit a target with great accuracy while avoiding heavy ground fire. The missile was eleven feet long, weighed 540 pounds and carried a 250 pound warhead. With a top speed of Mach two and a range of three miles, the Bullpup was steered to its target by the launching pilot, who directed the missile by means of a small control stick. The stick transmitted radio signals to the missile which the pilot tracked through his gunsight with the aid of a small flare mounted in the Bullpup's tail.

Along with VMA-223, VA-126 was tasked with putting the FJ-4B through the Fleet Introduction Program. The squadron was easily recognized by its Black stylized bird on the fuselage. This insignia was very similar to the North American company logo. (USN)



The FJ-4B could carry a total of five ASM-N-7s along with a missile guidance pod (carried on the inboard starboard wing station). The first operational deployment of Bullpup armed FJ-4Bs took place during the Spring of 1959, when VA-212 deployed aboard USS LEXINGTON (CVA-16) for a WestPac (Western Pacific) cruise. In the event, the Bullpup armed FJ-4Bs were soon in service with other Pacific fleet units, although none were delivered to Atlantic fleet units.

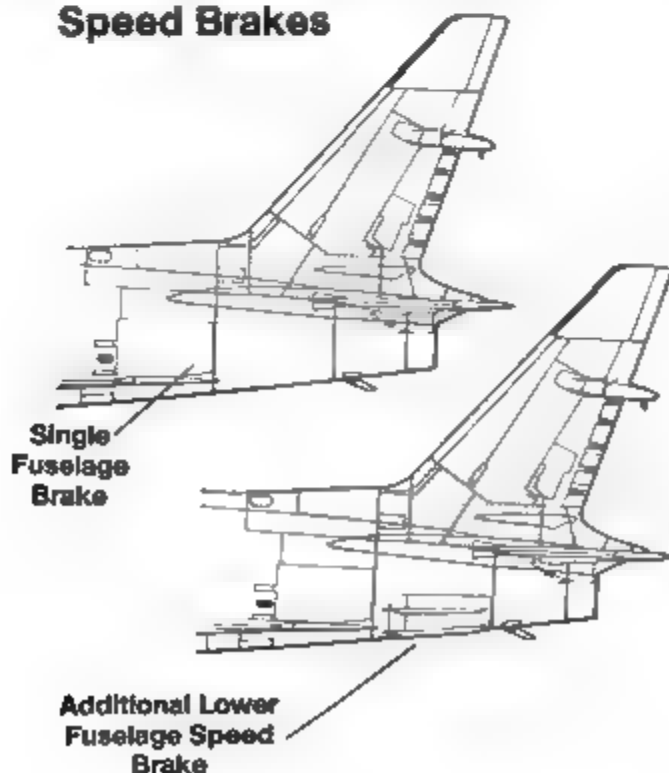
Eventually, nine Navy and three Marine squadrons would be re-equipped with the FJ-4B by the Spring of 1958. The first two squadrons were VA-126 and VMA-223 which put the aircraft through the Fleet Introduction Program (FIP) at NAS Moffett Field, California, during 1957. The Marines of VMA-223 operated both the FJ-4 and FJ-4B during their transition, using the FJ-4s as trainers until sufficient quantities of FJ-4Bs were available.

During early Fall of 1958, two Marine Squadrons were involved in the first trans-Pacific crossing by Navy or Marine single seat aircraft. VMA-212 and VMA-214 made the historic flight during the first week of August to reinforce U.S. Pacific Forces in the face of Communist Chinese actions against Taiwan. The communists were conducting a bombardment of the Chinese Nationalist islands of Quemoy and Matsu. Other Navy and Marine Fury units were already in the area aboard various carriers and were involved in daily combat air patrols over the Gulf of Taiwan during the cruises. Marine squadrons moved ashore on Taiwan, and although there were some close calls, hostilities were avoided and eventually the Chinese Communists backed down.

By the late 1950s both the FJ-4 and FJ-4B began to be replaced by newer fighter and attack aircraft. A number of each variant was assigned to various Reserve units including Naval Air Station Dallas, Texas; NAS South Weymouth, Mass., NAS Willow Grove, Pennsylvania; NAS New York, and NAS Memphis, Tenn., along with several utility (VU) squadrons. The number of units flying the Fury steadily diminished, with the last front line unit to operate the FJ-4B, VA-216, phasing out its aircraft during late 1962. Most of the aircraft not assigned to the Reserves were ferried out to be stored at Litchfield Park and Davis Monthan. These aircraft were eventually stripped of useful items and sold to civilian contractors as scrap.

Speed Brakes

FJ-4



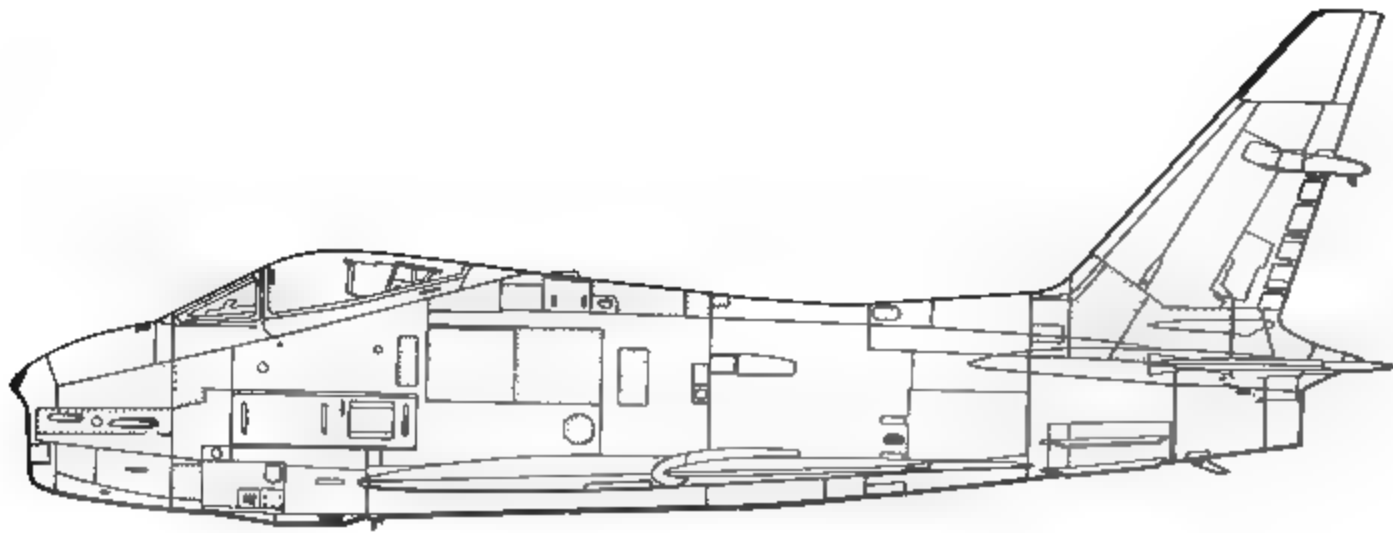
FJ-4B



The FJ-4B was used primarily to equip Navy and Marine attack squadrons. VMA-223 was one of the few Marine units to operate the FJ-4B. Squadron markings consisted of Red lightning bolts against White bands on the fuselage and tail. (Larkin)

The FJ-4B had the capability to delivery tactical nuclear weapons. This FJ-4B of VA-216 is loaded with a practice A-bomb (known as a shape) at a public weapons display during the Fall of 1959. VA-216 was destined to be the last fleet squadron to operate the Fury. (Larkin)





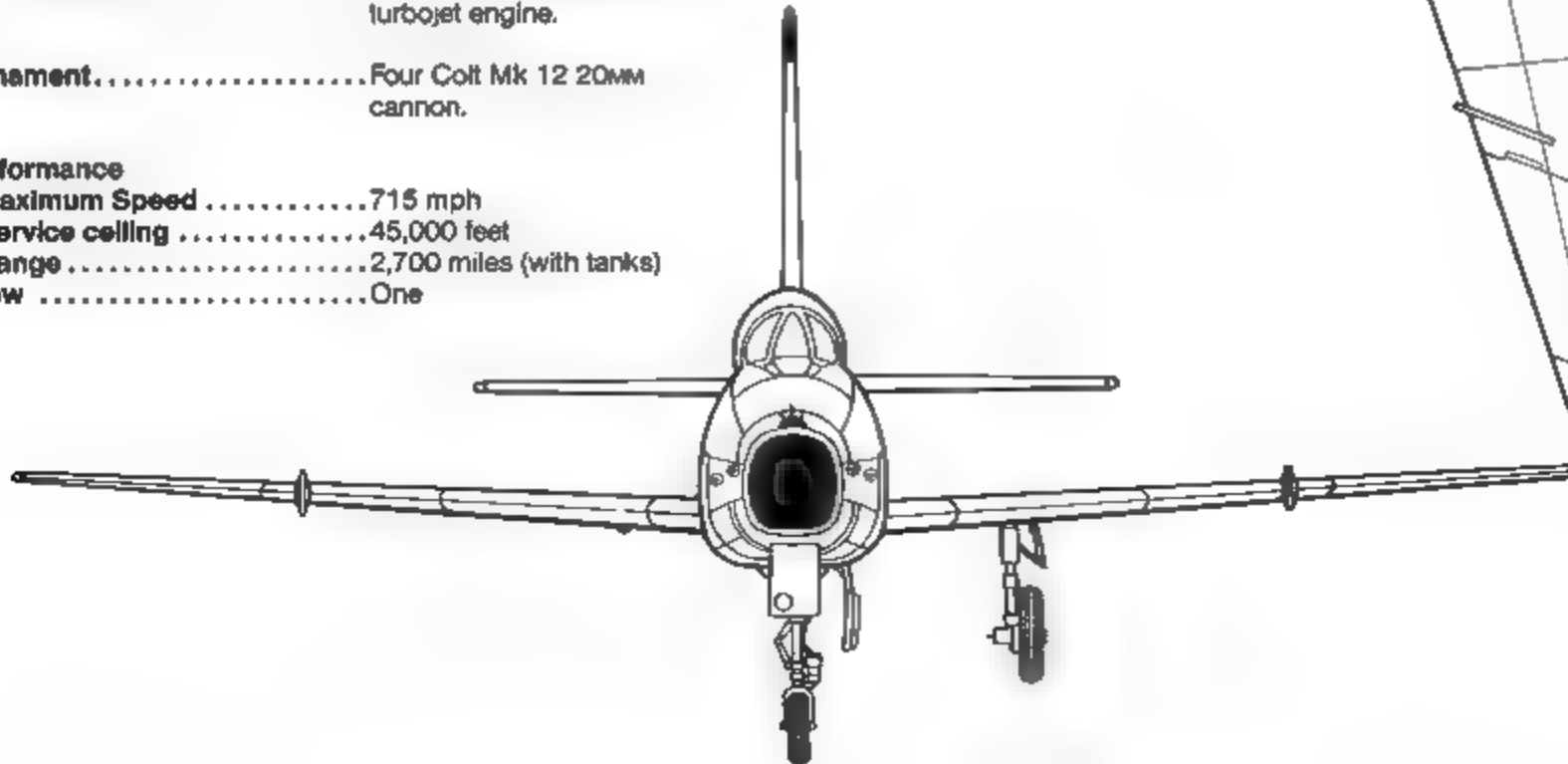
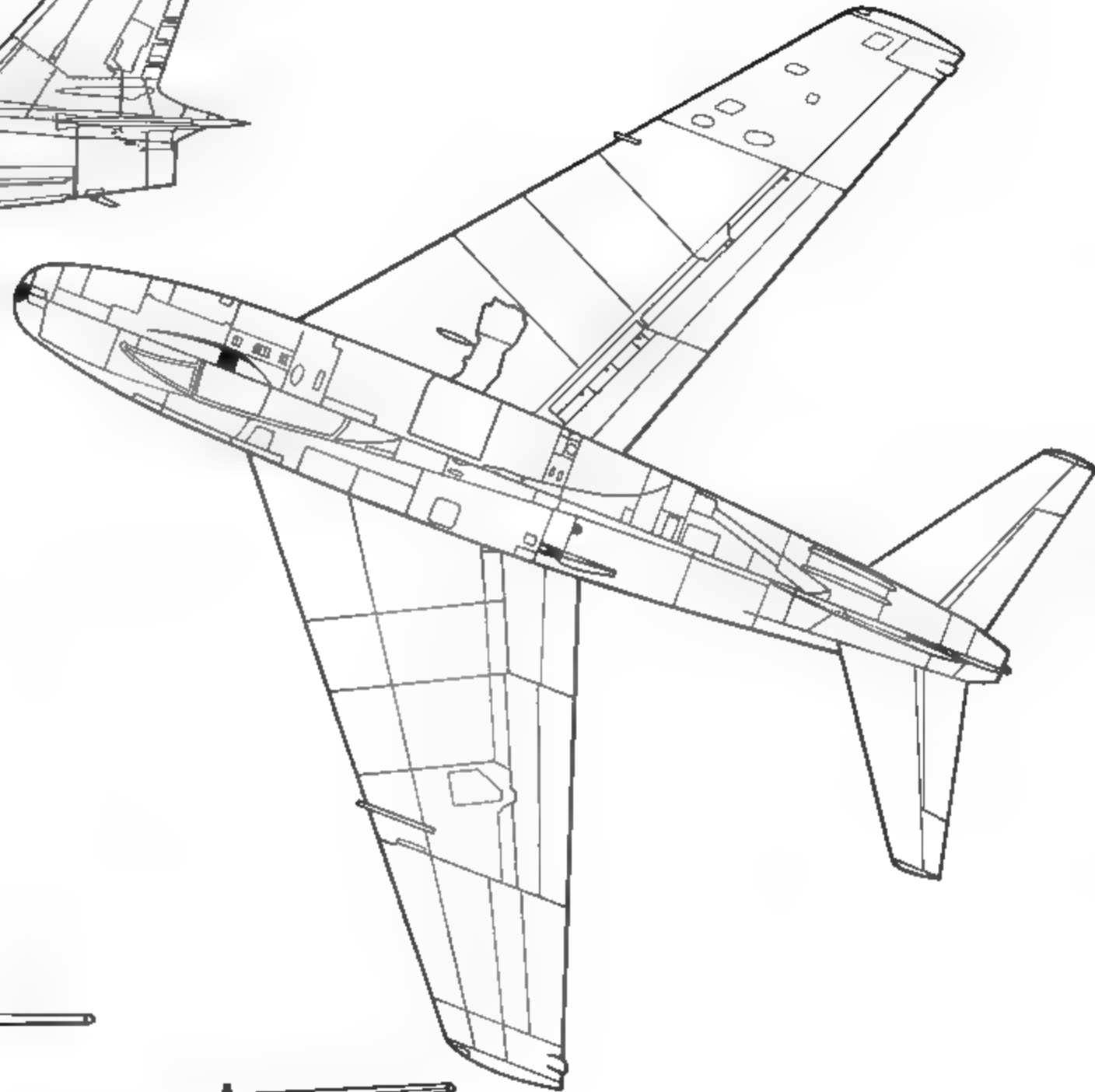
Specifications

North American FJ-4B Fury

Wingspan 39 feet 1 inch
Length 36 feet 4 inches
Height 13 feet 11 inches
Empty Weight 13,895 pounds
Maximum Weight 26,000 pounds
Powerplants One 7,700 lbf Wright J65-W-16 turbojet engine.

Armament Four Colt Mk 12 20mm cannon.

Performance
Maximum Speed 715 mph
Service ceiling 45,000 feet
Range 2,700 miles (with tanks)
Crew One





Its range and in-flight refueling capability allowed the FJ-4B to participate in the first trans-Pacific crossing by Navy or Marine single seat aircraft. Operation CANNONBALL took place during October of 1958 and one of the units involved was VMA-212. (USN)



All FJ-4s and FJ-4Bs were assigned to Pacific based attack units. Three FJ-4Bs of VA-192 bank over Mt. Fuji, Japan, during a training mission. The two aircraft in the background are carrying buddy refueling stores. (USN)

The buddy refueling package allowed the FJ-4 and FJ-4B to transfer over 3,000 pounds of fuel to another aircraft, which for the Fury meant roughly a fifty percent increase in combat radius. An FJ-4B of VA-146 takes fuel from a Fury of VA-116, while an F-8 Crusader takes on fuel from an A-1 Skyraider during a demonstration over NAS Miramar. (USN)

An FJ-4B of VA-63 goes off the angle deck aboard USS MIDWAY (CVA-41) after missing a wire during a landing attempt. VA-63 carried a Blue flash on the nose along with Blue bands on the rudder. (USN)





The FJ-4B could carry the ASM-N-7 Bullpup radar guided, air-to-surface missile. This Fury of VX-4 carries a maximum load of five Bullpups and the missile guidance pod which was carried under the starboard wing. (USN)



An FJ-4B of VA-212 is prepared for launch from the starboard catapult aboard USS LEXINGTON (CVA-16). The squadron markings consisted of a Medium Blue checkerboard tail and fuselage flash. (USN)

An FJ-4B of VA-63 sits on the ramp with its wings folded and an FOD cover over its intake. The wing fold system on the FJ-4 was different than on the earlier FJ-2 and FJ-3 with only the outer wing panels being foldable. (Larkin)



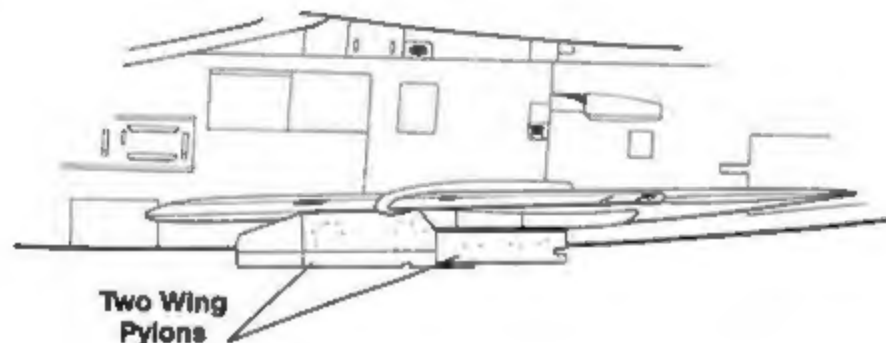
A trio of FJ-4Bs of VA-146 fly formation near NAS Miramar, California, during February of 1961. The aircraft in the background is assigned to the Air Group Commander (side number 00) and carries a buddy refueling store. (USN)



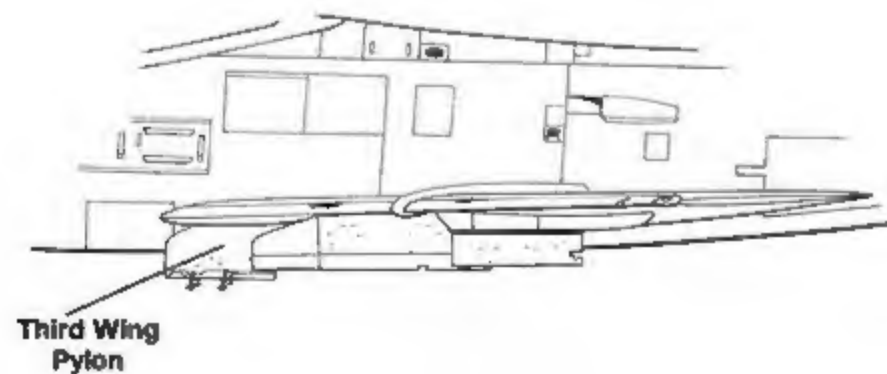
This Fury of VMF-451 was deployed to Pint-Tung North Airfield on Taiwan during 1959. Because of the tension in the area, the Marine fighters were configured with Sidewinder missile rails on the outboard pylons. (Harold B. Caldwell)

Weapons Pylons

FJ-4



FJ-4B



The shooting star insignia carried on this FJ-4B of VA-151 was one of the most easily recognized unit markings ever applied to the Fury. The star was White with a medium Blue outline and number. The aircraft also had small Blue and White stars on the fuselage and tail. (Larkin)

This FJ-4B of VA-151 was assigned as the squadron aircraft reserved for Commander, Air Task Group One. The star was outlined (from the inside) with Yellow, Red, and Blue to signify the units under his command. The same was done with the small fuselage and tail stars, each being one of the basic colors outlined in White. (Larkin)





A formation of FJ-4Bs of VA-214 pass over Diamond Head, Hawaii, during early 1958. The center aircraft carries the markings of Commander, Air Task Group 4. (USN)



This reserve FJ-4B operated from NAS Willow Grove, Pennsylvania. The Fury carried an Orange fin and White rudder. The 7W tail code identified the aircraft as a reserve fighter-trainer. (Larkin)

This FJ-4B Fury was assigned to the Fleet Air Gunnery Unit (FAGU) and was tasked with improving the air-to-air combat skills of various fleet units. Their mission was similar to that of the aggressor units of today. (Larkin)



This FJ-4B Fury was assigned to the Naval Air Test Center and carries a pair of buddy refueling stores on the center wing stations. The aircraft carries high visibility markings consisting of International Orange bands on the nose and tail.



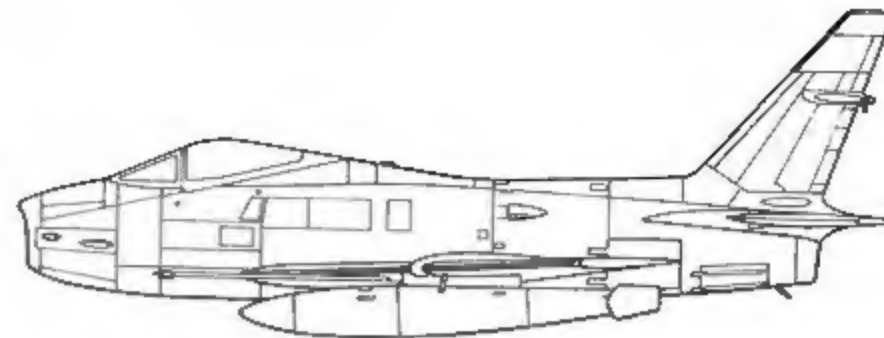
FJ-4F

Two FJ-4s from the initial production run (BuNos 139282 and 139284) were selected as test airframes for a Navy sponsored, mixed power plant research project. These aircraft were modified to test the AR-1 rocket engine developed by North American's Rocketdyne Division. This engine, which was fuelled by a mix of high test hydrogen peroxide (HTP) and JP-4, was to be used in the Chance Vought F8U-3 Crusader III fighter. Initial design work on the project began during August of 1955 under the company designation NA-234. Later, during May of 1956, work began on converting the two airframes as project NA-248. The 6,000 lbf rocket engine was installed at the base of the fin above the jet tailpipe.

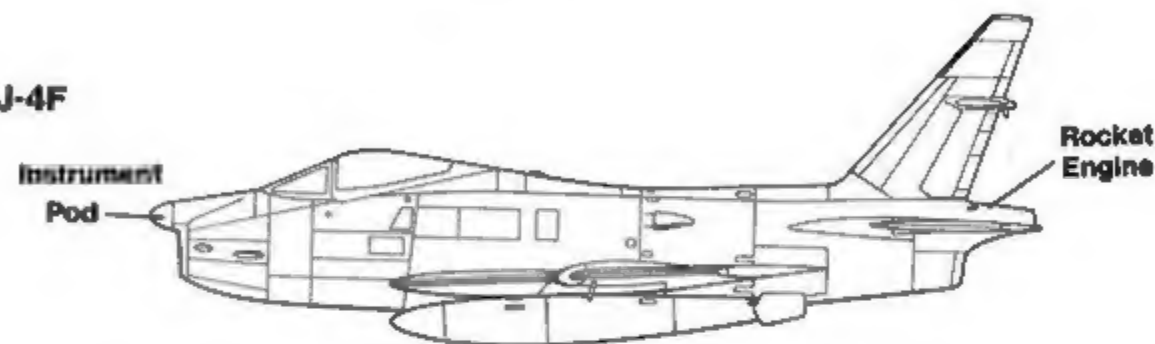
In addition to the rocket engine, the FJ-4Fs were modified with a removable flush mounted ventral fuel tank and a special instrument nose cone (which closely resembled a small radome), although during their operational lives, both aircraft flew with and without these features. Both aircraft were completed during the Spring of 1957 and were used to conduct extensive tests of the rocket motors. Upon completion of the project, both were retired to the reclamation center at Davis Monthan AFB and eventually scrapped.

The second and fourth production FJ-4s were modified to test the AR-1 rocket engine developed by North American (which was to be used in the Vought Crusader III). The motor was mounted over the tail and used a mix of hydrogen peroxide and JP-4 for fuel. (USN)

FJ-4B



FJ-4F



FJ-2 Furys of two Marine squadrons, VMF-451 and VMF-235, conduct carrier qualifications off Japan. The squadrons were based at Naval Air Station Atsugi, Japan, during 1955.



An FJ-4 Fury of the Fleet Air Gunnery Unit at Naval Air Station Miramar, California, during 1957. NAS Miramar was home base for all Pacific based Navy fighter squadrons.

